



VERIFICATION TEST REPORT

FOR THE

LINK-IT TAG (TRANSMITTER) AND READER (RECEIVER), L-TG501 AND L-RX100

FCC PART 15 SUBPART B SECTIONS 15.107, 15.109 & 15.111 AND FCC PART 15 SUBPART C SECTION 15.231

COMPLIANCE

DATE OF ISSUE: DECEMBER 13, 2000

PREPARED FOR:

Automated Identification Technologies (Pty)
P.O. Box 490, Block 2B Upper Level
Cnr Rivonia Blvd. & 9th Avenue/Rivonia
Parklands, South Africa 2121

P.O. No: P2001000621
W.O. No: 75638

Report No: FC00-113

PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: November 27 through
December 5, 2000

DOCUMENTATION CONTROL:

Tracy Phillips
Documentation Control Supervisor
CKC Laboratories, Inc.

APPROVED BY:

Dennis Ward
Director of Laboratories
CKC Laboratories, Inc.

This report contains a total of 51 pages and may be reproduced in full only. Partial reproduction may only be done with the written consent of CKC Laboratories, Inc.

TABLE OF CONTENTS

Administrative Information	4
Summary Of Results.....	5
Equipment Under Test (EUT) Description.....	5
Measurement Uncertainty.....	5
EUT Operating Frequency.....	5
Peripheral Devices	6
Report Of Measurements.....	7
Table 1: Fundamental Radiated Emission Levels - Transmitter	7
Table 2: Highest Radiated Emission Levels - 30-1000 MHz - Transmitter	8
Table 3: Six Highest Radiated Emission Levels - 1-4.33 GHz - Transmitter	9
Table 4: Six Highest Antenna Conducted Emission Levels - Receiver	10
Table 5: Six Highest Radiated Emission Levels - 30-1000MHZ - Receiver	11
Table 6: Radiated Emission Levels - 1-4.33 GHz - Receiver	12
Table 7: Six Highest Conducted Emission Levels - Receiver	13
Table A : List Of Test Equipment	14
EUT Setup	15
Test Instrumentation And Analyzer Settings.....	16
Table B : Analyzer Bandwidth Settings Per Frequency Range.....	16
Spectrum Analyzer Detector Functions.....	17
Peak	17
Quasi-Peak.....	17
Average.....	17
Test Methods	18
Radiated Emissions Testing.....	18
Conducted Emissions Testing	19
Occupied Bandwidth	19
Antenna Conducted Measurements	19
Sample Calculations	20
Appendix A : Information About The Equipment Under Test.....	21
Receiver I/O Ports	22
Receiver Crystal Oscillators	22
Printed Circuit Boards	22
Required EUT Changes To Comply.....	22
Photograph Showing Radiated Emissions - Transmitter.....	24
Photograph Showing Radiated Emissions - Transmitter.....	25
Photograph Showing Antenna Conducted - Receiver	26
Photograph Showing Radiated Emissions.....	27
Photograph Showing Radiated Emissions - Receiver	28
Photograph Showing Conducted Emissions - Receiver	29
Photograph Showing Conducted Emissions - Receiver	30

Appendix B : Measurement Data Sheets	31
Occupied Bandwidth Plot	32
Occupied Bandwidth Plot	33
Pulse Duration Plot	34
Pulse Duration Plot	35
Pulse Repetition Plot	36

CKC Laboratories, Inc. has Certificates of Accreditation from the following agencies:
DATEch (Germany); A2LA (USA); FCC (USA); VCCI (Japan); BSMI (Taiwan); HOKLAS (Hong Kong).
CKC Laboratories, Inc. has Letters of Acceptance through an MRA for the following agencies:
ACA/NATA (Australia); SABS (South Africa); SWEDAC (Sweden); TUV Rheinland-Germany; TUV Rheinland-Korea; TUV Rheinland-Russia; Radio Communications Agency (RA); NEMKO (Norway).

ADMINISTRATIVE INFORMATION

DATE OF TEST: November 27 - December 5, 2000

PURPOSE OF TEST: To demonstrate the compliance of the Link-it Tag (Transmitter) and Reader (Receiver), L-TG501 and L-RX100, with the requirements for FCC Part 15 Subpart B Sections 15.107, 15.109 & 15.111 and FCC Part 15 Subpart C Section 15.231 devices.

MANUFACTURER: Automated Identification Technologies (Pty)
P.O. Box 490, Block 2B Upper Level
Cnr Rivonia Blvd. & 9th Avenue/Rivonia
Parklands, South Africa 2121

REPRESENTATIVE: Andrew Evangelidis

TEST LOCATION: CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

TEST PERSONNEL: Randal Clark

TEST METHOD: ANSI C63.4 1992

FREQUENCY RANGE TESTED: 450 kHz - 4.33 GHz

EQUIPMENT UNDER TEST:

<u>Link-it Tag (Transmitter)</u>	<u>Link-it Reader (Receiver)</u>
Manuf: Omnigo	Manuf: Microtronix
Model: L-TG501	Model: L-RX100
Serial: 4278612-5010	Serial: 402354
FCC ID: O6XL-TG501 (pending)	FCC ID: DoC

SUMMARY OF RESULTS

The Automated Identification Technologies Link-it Tag (Transmitter) and Reader (Receiver), L-TG501 and L-RX100, was tested in accordance with ANSI C63.4 1992 for compliance with FCC Part 15 Subpart B Sections 15.107, 15.109 & 15.111 and FCC Part 15 Subpart C Section 15.231.

As received, the above equipment was found to be fully compliant with the limits of FCC Part 15 Subpart B Sections 15.107, 15.109 & 15.111 and FCC Part 15 Subpart C Section 15.231. The results in this report apply only to the items tested, as identified herein.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The model L-TG501 is a low power RF ASK transmitter at 433.92 MHz for use in active tagging technology. It operates on a battery and has no I/O cables. The model L-RX100 is a receiver which can operate on battery or DC power provided through a DC power supply. It reads data from the Link-it Tag and outputs the tag in RS232 format to a PC.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a ± 4 dB measurement uncertainty.

EUT OPERATING FREQUENCY

The EUT was operating at 433.92 MHz.

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Power Supply

Manuf: HP
Model: 6205C
Serial: 2228A01775
FCC ID: N/A

Computer

Manuf: IBM
Model: Think Pad 600
Serial: 78-LD521
FCC ID: 4U6JPN-32476-FT-E

Active Tag

Manuf: Automated Identification Technologies
Model: L-TG501
Serial: 4278612-9
FCC ID: O6XL-TG501 (pending)

REPORT OF MEASUREMENTS

The following tables report the highest worst case levels recorded during the tests performed on the Link-it Tag (Transmitter) and Reader (Receiver), L-TG501 and L-RX100. All readings taken are peak readings unless otherwise noted by a “Q” or “A”. The data sheets from which these tables were compiled are contained in Appendix B.

Table 1: Fundamental Radiated Emission Levels - Transmitter									
FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Log dB	Amp dB	Cable dB	15.35 dB				
433.850	90.9	16.8	-25.6	4.4	-20.0	66.5	72.6	-6.1	H-1
433.850	80.3	16.8	-25.6	4.4	-20.0	55.9	72.6	-16.7	V-1
433.860	76.3	16.8	-25.6	4.4	-20.0	51.9	72.6	-20.7	V-2
433.870	88.9	16.8	-25.6	4.4	-20.0	64.5	72.6	-8.1	H-2

Test Method: ANSI C63.4 1992
Spec Limit : FCC Part 15.231(e)
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
1 - Card flat on table
2 – Card on edge

COMMENTS: EUT is an active tag transmitting on 433.92MHz. EUT is battery powered and battery is non-removable. EUT has an integral antenna. Duty cycle correction factor (20dB) used in accordance with FCC Part 15.35.

Table 2: Highest Radiated Emission Levels - 30-1000 MHz - Transmitter

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Log dB	Amp dB	Cable dB	15.35 dB				
867.630	57.7	23.0	-25.9	6.5	-20.0	41.3	54.0	-12.7	H
867.703	56.4	23.0	-25.9	6.5	-20.0	40.0	54.0	-14.0	V

Test Method: ANSI C63.4 1992
Spec Limit : FCC Part 15.231(e)
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is an active tag transmitting on 433.92MHz. EUT is battery powered and battery is non-removable. EUT has an integral antenna. Duty cycle correction factor (20dB) used in accordance with 15.35.

Table 3: Six Highest Radiated Emission Levels - 1-4.33 GHz - Transmitter

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	15.35 dB				
1301.498	62.9	24.8	-35.8	5.4	-20.0	37.3	54.0	-16.7	H
1735.130	54.0	26.0	-35.5	6.2	-20.0	30.7	54.0	-23.3	V
2169.217	50.2	27.7	-35.0	10.6	-20.0	33.5	54.0	-20.5	H
3036.886	35.6	33.1	-35.5	16.2	-20.0	29.4	54.0	-24.6	V
3470.737	34.7	34.8	-35.9	15.8	-20.0	29.4	54.0	-24.6	V
3904.499	34.7	38.1	-36.1	14.1	-20.0	30.8	54.0	-23.2	V

Test Method:
Spec Limit :
Test Distance:

ANSI C63.4 1992
FCC Part 15.231(e)
3 Meters

NOTES: H = Horizontal Polarization
 V = Vertical Polarization

COMMENTS: EUT is an active tag transmitting on 433.92MHz. EUT is battery powered and battery is non-removable. EUT has an integral antenna. Duty cycle correction factor (20dB) used in accordance with FCC Part 15.35.

Table 4: Six Highest Antenna Conducted Emission Levels - Receiver

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
48.080	28.1	0.0				28.1	50.0	-21.9	N
218.095	26.9	0.0				26.9	50.0	-23.1	N
232.123	28.7	0.0				28.7	50.0	-21.3	N
240.105	28.2	0.0				28.2	50.0	-21.8	N
846.516	33.5	0.0				33.5	50.0	-16.5	N
1692.913	28.6	0.0				28.6	50.0	-21.4	N

Test Method: ANSI C63.4 1992
Spec Limit : FCC Part 15.111
Test Distance: No Distance

NOTES: N = No Polarization

COMMENTS: EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply.

Table 5: Six Highest Radiated Emission Levels - 30-1000MHZ - Receiver

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
54.024	43.1	10.2	-24.9	1.4		29.8	40.0	-10.2	V
74.099	46.6	7.8	-25.0	1.6		31.0	40.0	-9.0	H
318.763	37.8	20.4	-24.9	3.8		37.1	46.0	-8.9	V
338.690	40.7	19.3	-25.0	3.9		38.9	46.0	-7.1	V
378.620	41.3	17.4	-25.3	4.0		37.4	46.0	-8.6	V
890.318	34.1	23.4	-25.7	6.7		38.5	46.0	-7.5	HQ

Test Method: ANSI C63.4 1992
Spec Limit : FCC Part 15.109
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
N = No Polarization
D = Dipole Reading
Q = Quasi Peak Reading
A = Average Reading

COMMENTS: EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply.

Table 6: Radiated Emission Levels - 1-4.33 GHz - Receiver

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
1085.663	45.2	24.0	-35.9	4.9		38.2	54.0	-15.8	V
1951.350	46.7	26.4	-35.3	6.5		44.3	54.0	-9.7	V
1955.290	46.1	26.4	-35.3	6.6		43.8	54.0	-10.2	H
1955.354	47.5	26.4	-35.3	6.6		45.2	54.0	-8.8	V
1963.190	47.0	26.4	-35.3	6.6		44.7	54.0	-9.3	H

Test Method: ANSI C63.4 1992
Spec Limit : FCC Part 15.109
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
N = No Polarization
D = Dipole Reading
Q = Quasi Peak Reading
A = Average Reading

COMMENTS: EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply.

Table 7: Six Highest Conducted Emission Levels - Receiver

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV	SPEC LIMIT dBμV	MARGIN dB	NOTES
		Lisn dB	Cable dB						
7.130400	34.3	0.2	3.3			37.8	48.0	-10.2	W
8.400935	34.7	0.2	3.2			38.1	48.0	-9.9	B
8.646845	34.3	0.2	4.2			38.7	48.0	-9.3	B
8.810784	34.6	0.2	4.8			39.6	48.0	-8.4	B
8.988386	33.5	0.2	5.5			39.2	48.0	-8.8	B
9.097679	34.5	0.2	5.1			39.8	48.0	-8.2	B

Test Method:
Spec Limit :

ANSI C63.4 1992
FCC Part 15.107

NOTES: Q = Quasi Peak Reading
 A = Average Reading
 B = Black Lead
 W = White Lead

COMMENTS: EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply. Support computer powered through support LISN.

TABLE A
LIST OF TEST EQUIPMENT

Industry Canada File No. IC 3082-D

1. Spectrum Analyzer, Hewlett Packard, Model No. 8566B, CKC 1, S/N 2403A08241 (Display Unit), S/N 2209A01404 (rf Unit). Calibration date: November 3, 2000. Calibration due date: November 3, 2001.
2. Preamp (1-26.5GHz), Hewlett Packard, Model No. 8449B, S/N 3008A00301. Calibration date: October 13, 2000. Calibration due date: October 13, 2001.
3. Preamp, Hewlett Packard, Model No. 8447D, S/N 1937A02604. Calibration Date: April 3, 2000. Calibration Due: April 3, 2001.
4. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N 2043A00272. Calibration Date: November 10, 2000. Calibration Due: November 10, 2001.
5. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N 2811A01267. Calibration Date: November 3, 2000. Calibration Due: November 3, 2001.
6. Biconical Antenna, A & H Systems, Model No. SAS-200/542, S/N 156. Calibration Date: May 8, 2000. Calibration Due: May 8, 2001.
7. Log Periodic Antenna, A & H Systems, Model No. SAS-200/512, S/N 154. Calibration Date: May 8, 2000. Calibration Due: May 8, 2001.
8. Horn Antenna, EMC Test, Model 9602-4660, S/N 2113. Calibration Date: November 10, 2000. Calibration Due: November 10, 2001.
9. Cable #4 50', Andrew, FSJ1-50A, Calibration Date: May 10, 2000. Calibration Due: May 10, 2001.
10. Cable #2 (2'), Andrew, FSJ1-50A, Calibration Date: May 10, 2000. Calibration Due: May 10, 2001.
11. Cable # 7 25', Andrew, FSJ1-50A, Calibration Date: May 10, 2000. Calibration Due: May 10, 2001.
12. LISN's set, Solar, Model 8028-50-TS-24-BNC, S/N 814493, 474. Calibration Date: June 5, 2000. Calibration Due: June 5, 2001.
13. Mariposa Site B (Barn). Calibration date: August 11, 2000. Calibration due date: August 11, 2001.

EUT SETUP

The equipment under test (EUT) and the peripheral(s) listed were set up in a manner that represented their normal use. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Tables 1-7 for radiated and conducted emissions characteristics. Additionally, a complete description of all the receiver ports and I/O cables is included on the information sheets contained in Appendix A.

During radiated emissions testing, the EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters. This configuration is typical for radiated emissions testing of handheld and wallmount devices.

I/O cables were connected to the receiver EUT and peripherals in the manner required for normal operation of the system. Excess cabling was bundled in the center in a serpentine fashion using 30-40 centimeter lengths.

During conducted emissions testing, the EUT was located on a test bench measuring approximately 80 cm high, 1 meter deep, and 2 meters in length. One wall of the room where the EUT bench is located is conductive, and there is conductive strip 40 cm in width on the top surface of the test bench where the LISN's are located. The EUT was mounted on the wooden portion of the test bench 40 cm away from the conductive wall, and 80 cm from the conductive portion of the test bench surface.

The metal plane used for conducted emissions was grounded to the earth through the green wire safety ground. Power to the EUT was provided from a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 1 meter away from the EUT during the conducted test. Conducted emissions tests required the use of the LISN's listed in Table A.

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A were used to collect both the radiated and conducted emissions data for the Link-it Tag (Transmitter) and Reader (Receiver), L-TG501 and L-RX100. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. For testing above 1000 MHz, the horn antenna was used. All antennas were located at a distance of 3 meters from the edge of the EUT. Conducted emissions tests required the use of the FCC type LISN's.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dB μ V, and a vertical scale of 10 dB per division.

TABLE B : ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	450 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	4.3 GHz	1 MHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in Tables 1-7 indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the Link-it Tag (Transmitter) and Reader (Receiver), L-TG501 and L-RX100.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

When the frequencies exceed 1 GHz, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

TEST METHODS

The radiated and conducted emissions data of the Link-it Tag (Transmitter) and Reader (Receiver), L-TG501 and L-RX100, was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the "Sample Calculations". The corrected data was then compared to the FCC Part 15 Subpart B Sections 15.107, 15.109 & 15.111 and FCC Part 15 Subpart C Section 15.231 emissions limits to determine compliance.

Preliminary and final measurements were taken in order to better ensure that all emissions from the EUT were found and maximized.

Radiated Emissions Testing

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode with the I/O cables and line cords facing the antenna. The frequency range of 30 MHz - 88 MHz was then scanned with the biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks which were at or near the limit were recorded. The frequency range of 100 - 300 MHz was scanned with the biconical antenna in the same manner, and the peaks recorded. Lastly, a scan of the FM band from 88 - 110 MHz was made, using a reduced resolution bandwidth and a reduced frequency span. The biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 - 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 - 1000 MHz was again scanned. For frequencies above 1000 MHz the horn antenna was used. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

For the final radiated scan, the equipment was again positioned with the back of the unit facing the antenna. A thorough scan of all frequencies was manually made using a small frequency span, rotating the turntable as needed. Comparison with the previously recorded measurements was then made.

Using the peak readings from both scans as a guide, the test engineer then maximized the readings with respect to the table rotation, antenna height and configuration of the peripherals and cables. Maximizing of the receiver cables was achieved by monitoring the spectrum analyzer on a closed circuit television monitor while the EUT cables were being moved and rearranged on the EUT table for maximum emissions. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

Conducted Emissions Testing

For conducted emissions testing, a 30 to 50 second sweep time was used for automated measurements in the frequency bands of 450 kHz to 1.705 MHz, 1.705 MHz to 3 MHz, and 3 MHz to 30 MHz. All readings within 20 dB of the limit were recorded. At frequencies where the recorded emissions were close to the limit, further investigation was performed manually at a slower sweep rate.

FCC Part 15.231(c) - Occupied Bandwidth Measurements

In accordance with Part 15.231(c), the bandwidth was kept within the required .25% of the fundamental frequency.

FCC Part 15.111 – Antenna Conducted Measurements

For measuring the signal strength on the RF output port of the EUT, the spectrum analyzer was connected directly to the RF output port via a cable. The sweep time of the analyzer was adjusted so that the spectrum analyzer readings were always in a calibrated range. All readings within 20 dB of the limit were recorded.

SAMPLE CALCULATIONS

The basic spectrum analyzer reading was converted using correction factors as shown in the emissions readings in Tables 1-7. For radiated emissions in dB μ V/m, the spectrum analyzer reading in dB μ V was corrected by using the following formula:

$$\begin{aligned} & \text{Meter reading (dB}\mu\text{V)} \\ & + \text{Antenna Factor (dB)} \\ & + \text{Cable Loss (dB)} \\ & - \text{Distance Correction (dB)} \\ & - \text{Pre-amplifier Gain (dB)} \\ & = \text{Corrected Reading (dB}\mu\text{V/m)} \end{aligned}$$

This reading was then compared to the applicable specification limit to determine compliance.

A typical data sheet will display the following in column format:

#	Freq MHz	Rdng dBuV	Cable	Amp	Bicon	Horn	Log	Dist	Corr dBuV/m	Spec	Margin	Polar
	15.35											

means reading number

Freq MHz is the frequency in MHz of the obtained reading.

Rdng dBuV is the reading obtained on the spectrum analyzer in dB μ V.

Amp is short for the preamplifier factor or gain in dB.

Bicon is the biconical antenna factor in dB.

Log is the log periodic antenna factor in dB.

Horn is the horn antenna factor in dB.

Cable is the cable loss in dB of the coaxial cable on the OATS.

Dist is the distance factor (in dB). It is used when testing at a different test distance than the one stated in the spec.

Corr dBuV/m is the corrected reading which is now in dB μ V/m (field strength).

Spec is the specification limit (dB) stated in the regulations.

Margin is the closeness to the specified limit in dB; + is over and - is under the limit.

Polar is the Polarity of the antenna with respect to earth.

LISN is the line impedance stabilization network factor in dB.

15.35 is the distance correction called in FCC Part 15.35.

APPENDIX A

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST	
Test Software/Firmware: CRT was displaying: Power Supply Manufacturer: Power Supply Part Number: AC Line Filter Manufacturer: AC Line Filter Part Number:	V1.2 Panasonic 3.1V Battery
The transmitter has no power cord. DC power is 12V.	

RECEIVER I/O PORTS	
Type	#
TTL levels	5

RECEIVER CRYSTAL OSCILLATORS	
Type	Freq. In MHz
Processor clock	8 MHz
Receiver module	13.568 MHz

PRINTED CIRCUIT BOARDS				
Function	Model & Rev	Clocks, MHz	Layers	Location
RF Transmitter	L-TG501 V1.0	Internal 4 MHz	2	Center
Main Processor	RXTTL V1.2	1, 8 MHz	2	Center
Receiver Module	RF Mod1 V1.0	1, 13.568 MHz	2	Top

REQUIRED EUT CHANGES TO COMPLY:
None.

RECEIVER CABLE INFORMATION

Cable #: 1	Cable(s) of this type: 1
Cable Type: C5F 4 Pair 24 AWG FTP IEC332-1 Construction: Screened Twisted Pair Connected To End (1): PC Connector At End (1): DB9-Female Shield Grounded At (1): Yes Part Number:	Shield Type: Aluminum Foil Length In Meters: Max 1.8m Connected To End (2): Reader Connector At End (2): RJ45-Male Shield Grounded At (2): No Number of Conductors: 8
Notes and or description: For reader to output tag data in TTL levels on RS232 line to PC.	

PHOTOGRAPH SHOWING RADIATED EMISSIONS - TRANSMITTER



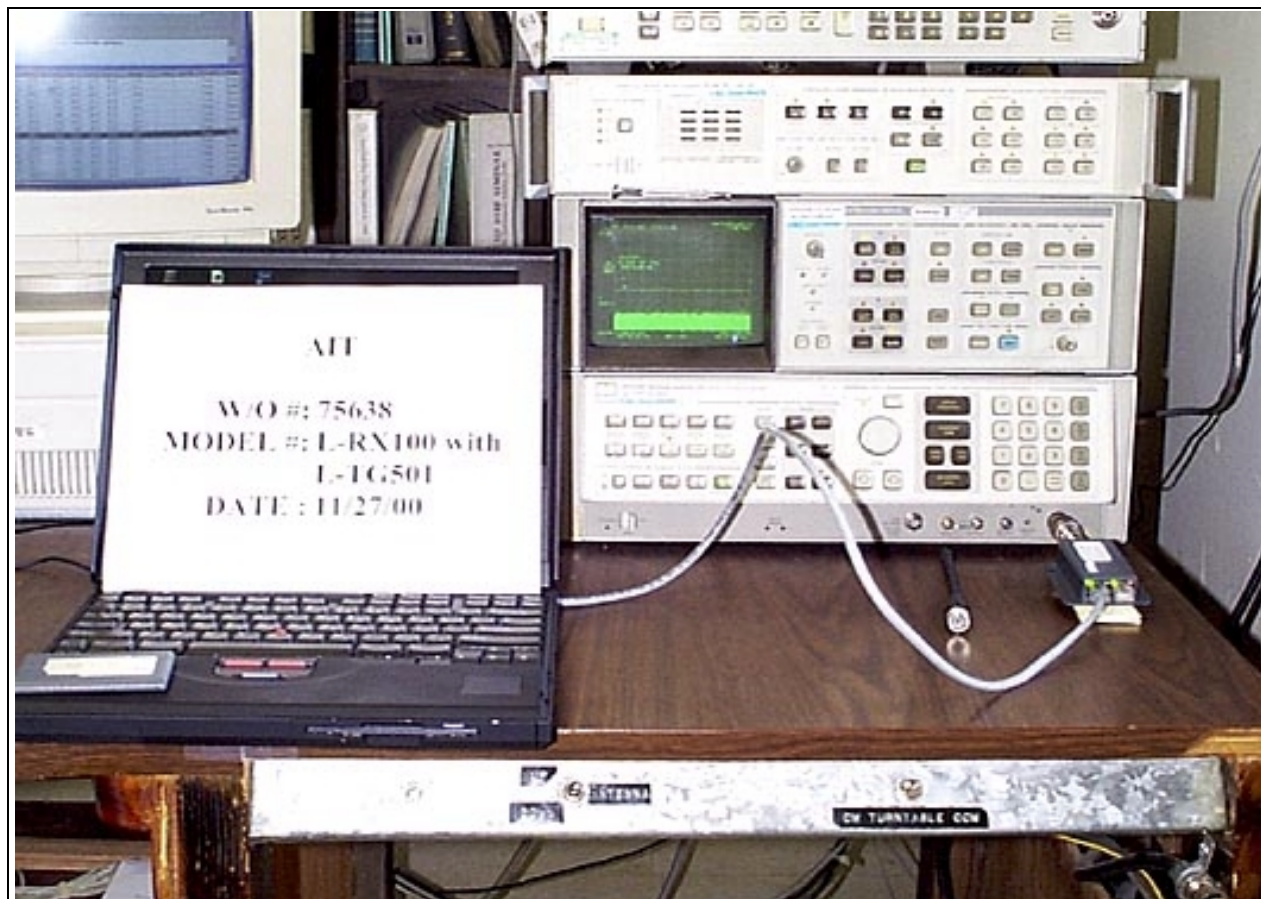
Radiated Emissions - Transmitter Flat

PHOTOGRAPH SHOWING RADIATED EMISSIONS - TRANSMITTER



Radiated Emissions - Transmitter on Edge

PHOTOGRAPH SHOWING ANTENNA CONDUCTED - RECEIVER



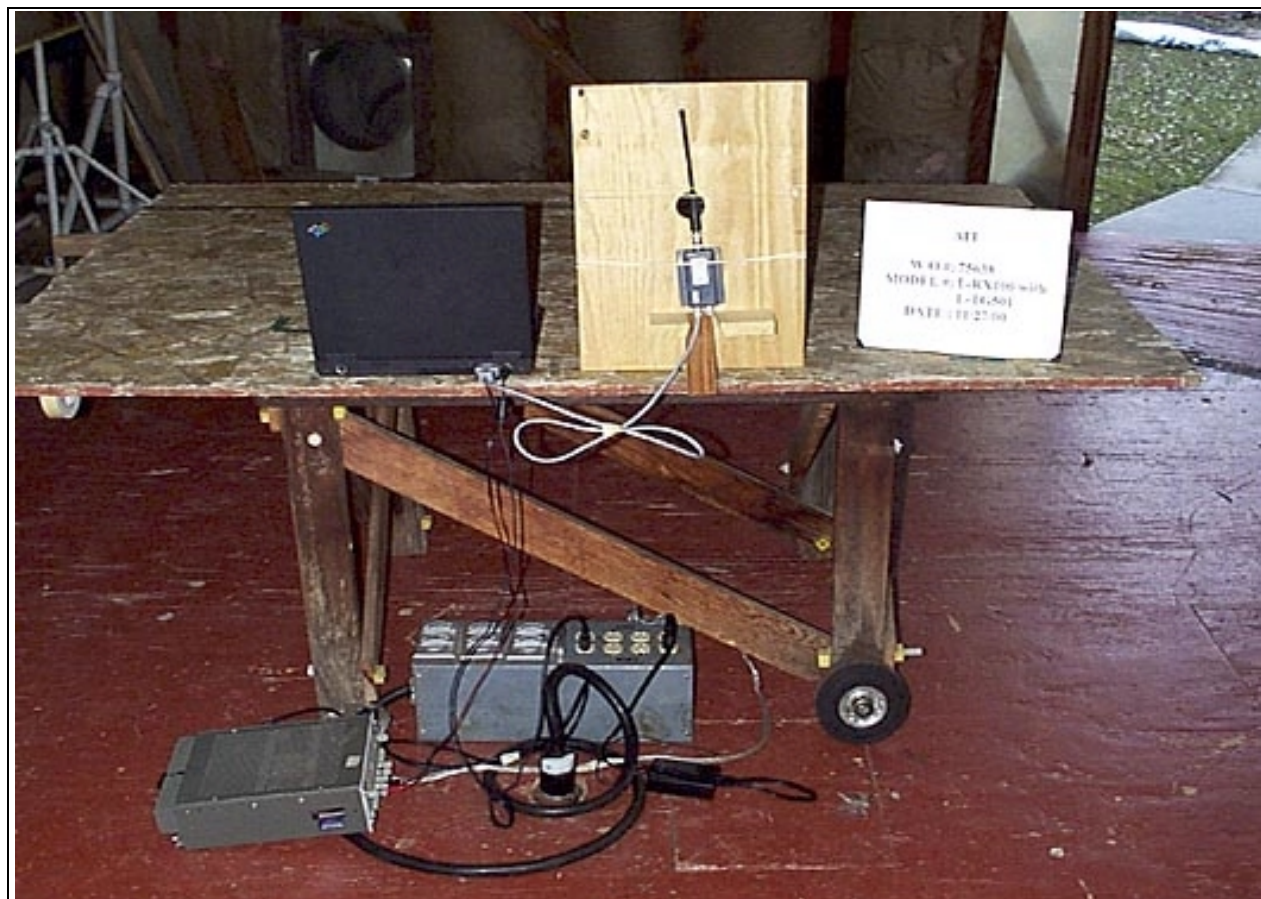
Antenna Conducted Emissions - Front View of Receiver

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View of Receiver

PHOTOGRAPH SHOWING RADIATED EMISSIONS - RECEIVER



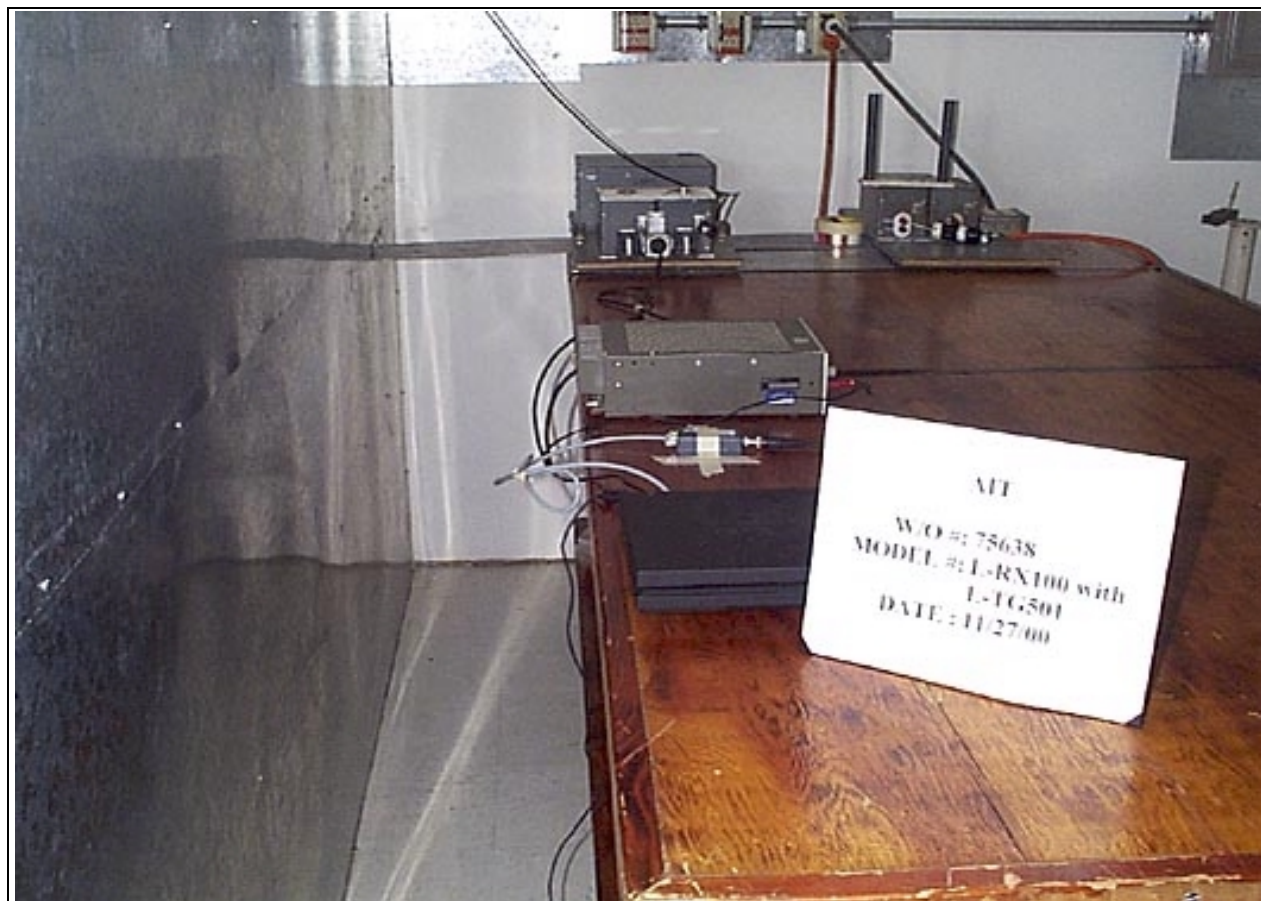
Radiated Emissions - Back View of Receiver

PHOTOGRAPH SHOWING CONDUCTED EMISSIONS - RECEIVER



Conducted Emissions - Front View of Receiver

PHOTOGRAPH SHOWING CONDUCTED EMISSIONS - RECEIVER

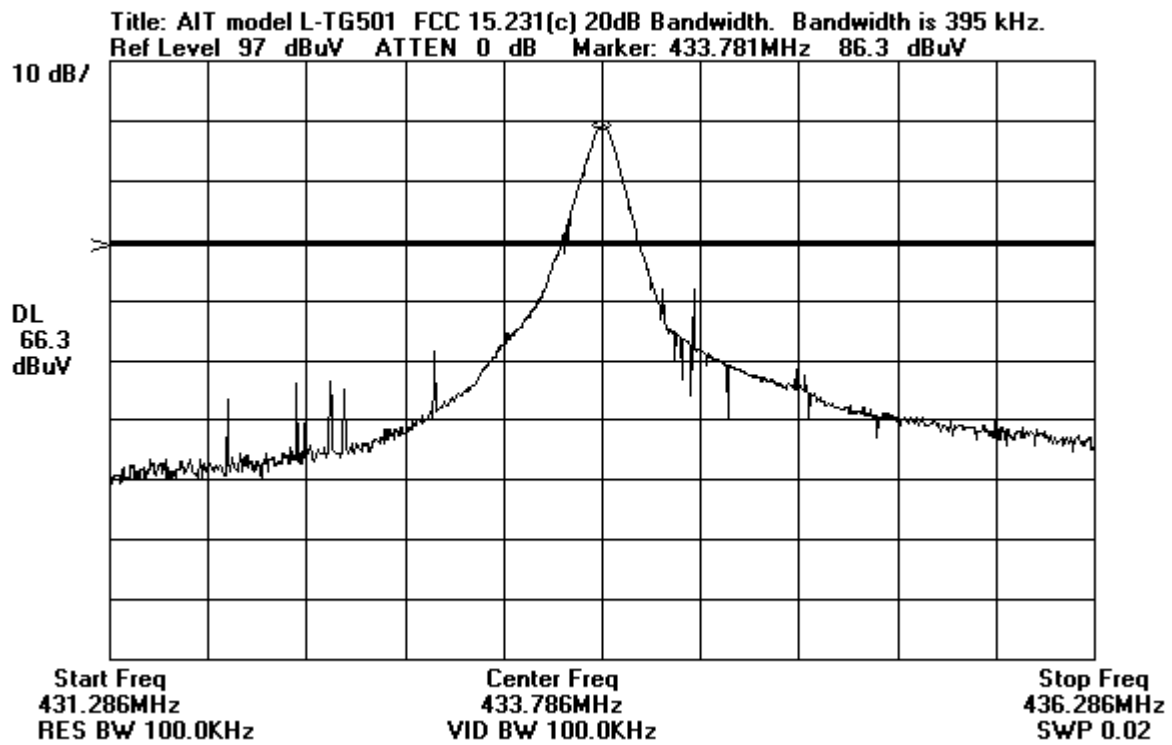


Conducted Emissions - Side View of Receiver

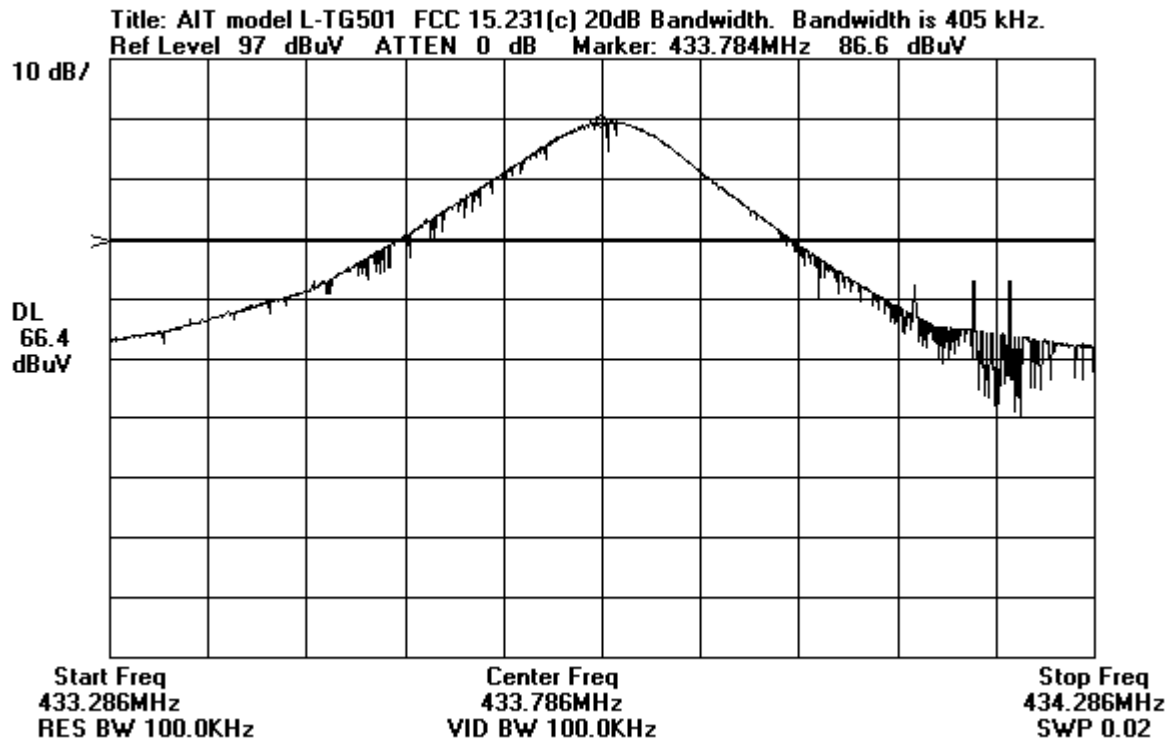
APPENDIX B

MEASUREMENT DATA SHEETS

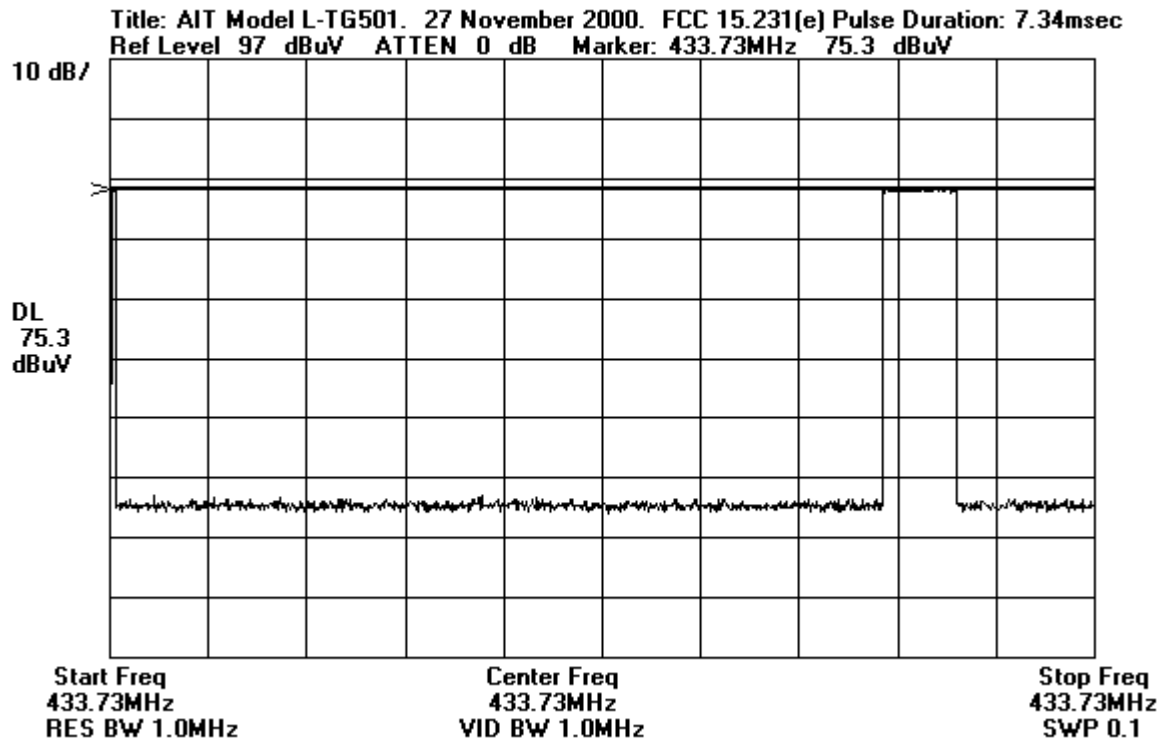
Occupied Bandwidth Plot



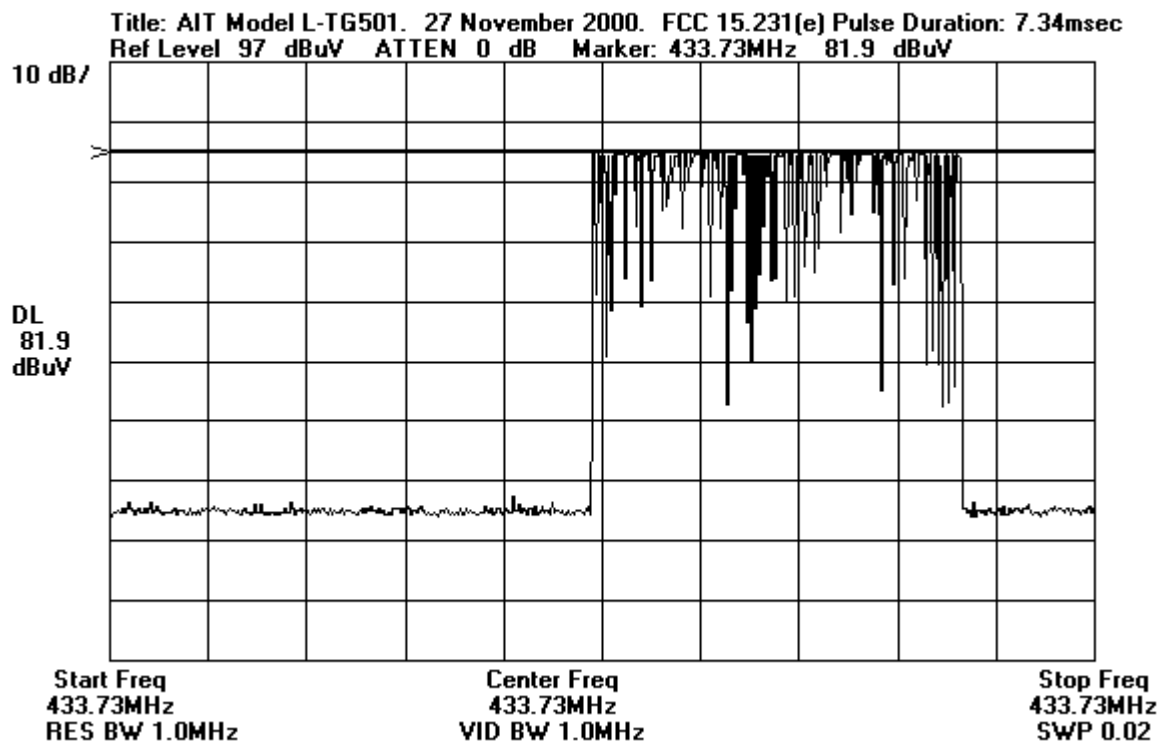
Occupied Bandwidth Plot



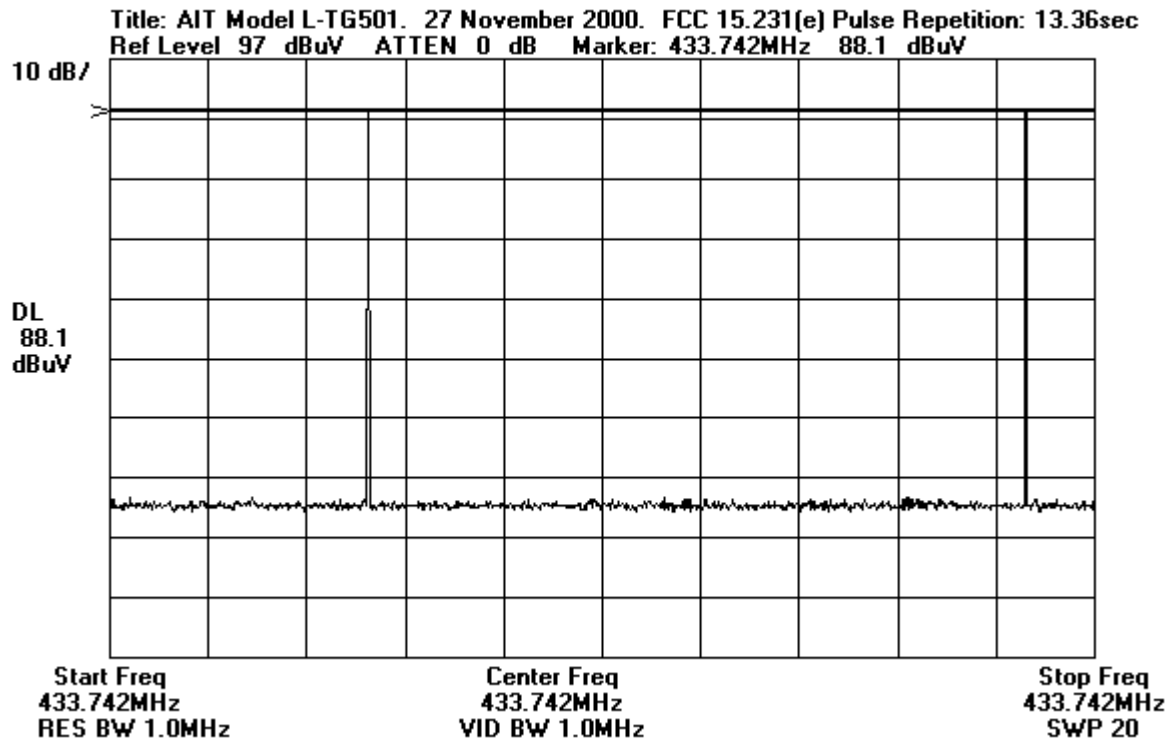
Pulse Duration Plot



Pulse Duration Plot



Pulse Repetition Plot



Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **AIT**
 Specification: **FCC 15.231(e) Fundamental**
 Work Order #: **75638** Date: 12/05/2000
 Test Type: **Maximized Emissions** Time: 13:24:25
 Equipment: **Active Tag** Sequence#: 10
 Manufacturer: AIT Tested By: Randal Clark
 Model: L-TG501
 S/N: 4278612-9

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Active Tag*	AIT	L-TG501	4278612-9

Support Devices:

Function	Manufacturer	Model #	S/N
----------	--------------	---------	-----

Test Conditions / Notes:

EUT is an active tag transmitting on 433.92MHz. EUT is battery powered and battery is non-removable. EUT has an integral antenna. Duty cycle correction factor (20dB) used in accordance with FCC Part 15.35.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp 15.35 dB	Bicon dB	Log dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	433.850M	90.9	-25.6 -20.0	+0.0	+16.8	+4.4	+0.0	66.5	72.6 Card flat on table	-6.1	Horiz
2	433.870M	88.9	-25.6 -20.0	+0.0	+16.8	+4.4	+0.0	64.5	72.6 Card on edge	-8.1	Horiz
3	433.850M	80.3	-25.6 -20.0	+0.0	+16.8	+4.4	+0.0	55.9	72.6 Card flat on table	-16.7	Vert
4	433.860M	76.3	-25.6 -20.0	+0.0	+16.8	+4.4	+0.0	51.9	72.6 Card on edge	-20.7	Vert

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **AIT**
Specification: **FCC 15.231(e) Spurious**
Work Order #: **75638**
Test Type: **Maximized Emissions**
Equipment: **Active Tag**
Manufacturer: **AIT**
Model: **L-TG501**
S/N: **4278612-9**

Date: 11/28/2000
Time: 16:23:51
Sequence#: 3
Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Active Tag*	AIT	L-TG501	4278612-10

Support Devices:

Function	Manufacturer	Model #	S/N
----------	--------------	---------	-----

Test Conditions / Notes:

EUT is an active tag transmitting on 433.92MHz. EUT is battery powered and battery is non-removable. EUT has an integral antenna. Duty cycle correction factor (20dB) used in accordance with FCC Part 15.35.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp 15.35 dB	Bicon dB	Log dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	867.630M	57.7	-25.9 -20.0	+0.0	+23.0	+6.5	+0.0	41.3	54.0	-12.7	Horiz
2	867.703M	56.4	-25.9 -20.0	+0.0	+23.0	+6.5	+0.0	40.0	54.0	-14.0	Vert

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **AIT**
 Specification: **FCC 15.231(e) Spurious**
 Work Order #: **75638**
 Test Type: **Maximized Emissions**
 Equipment: **Active Tag**
 Manufacturer: **AIT**
 Model: **L-TG501**
 S/N: **4278612-9**

Date: 11/28/2000
 Time: 16:08:07
 Sequence#: 4
 Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Active Tag*	AIT	L-TG501	4278612-10

Support Devices:

Function	Manufacturer	Model #	S/N
----------	--------------	---------	-----

Test Conditions / Notes:

EUT is an active tag transmitting on 433.92MHz. EUT is battery powered and battery is non-removable. EUT has an integral antenna. Duty cycle correction factor (20dB) used in accordance with FCC Part 15.35.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp Cable dB	Horn 15.35 dB	Cable dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	1301.498M	62.9	-35.8 +1.8	+24.8 -20.0	+0.2	+3.4	+0.0	37.3	54.0	-16.7	Horiz
2	2169.217M	50.2	-35.0 +3.5	+27.7 -20.0	+1.4	+5.7	+0.0	33.5	54.0	-20.5	Horiz
3	3904.499M	34.7	-36.1 +5.3	+38.1 -20.0	+1.7	+7.1	+0.0	30.8	54.0	-23.2	Vert
4	1735.130M	54.0	-35.5 +2.1	+26.0 -20.0	+0.2	+3.9	+0.0	30.7	54.0	-23.3	Vert
5	3470.737M	34.7	-35.9 +5.5	+34.8 -20.0	+3.1	+7.2	+0.0	29.4	54.0	-24.6	Vert
6	3036.886M	35.6	-35.5 +5.7	+33.1 -20.0	+3.4	+7.1	+0.0	29.4	54.0	-24.6	Vert
7	2169.036M	45.8	-35.0 +3.5	+27.7 -20.0	+1.4	+5.7	+0.0	29.1	54.0	-24.9	Vert
8	1301.315M	54.6	-35.8 +1.8	+24.8 -20.0	+0.2	+3.4	+0.0	29.0	54.0	-25.0	Vert
9	4338.373M	31.8	-35.4 +5.2	+37.7 -20.0	+1.7	+7.2	+0.0	28.2	54.0	-25.8	Horiz
10	2602.951M	34.9	-34.6 +5.8	+30.4 -20.0	+3.6	+8.0	+0.0	28.1	54.0	-25.9	Vert
11	3904.545M	31.0	-36.1 +5.3	+38.1 -20.0	+1.7	+7.1	+0.0	27.1	54.0	-26.9	Horiz
12	4338.392M	30.4	-35.4 +5.2	+37.7 -20.0	+1.7	+7.2	+0.0	26.8	54.0	-27.2	Vert
13	3036.864M	31.4	-35.5 +5.7	+33.1 -20.0	+3.4	+7.1	+0.0	25.2	54.0	-28.8	Horiz
14	3470.670M	28.9	-35.9 +5.5	+34.8 -20.0	+3.1	+7.2	+0.0	23.6	54.0	-30.4	Horiz

15	2602.953M	29.9	-34.6 +5.8	+30.4 -20.0	+3.6	+8.0	+0.0	23.1	54.0	-30.9	Horiz
16	1735.170M	44.6	-35.5 +2.1	+26.0 -20.0	+0.2	+3.9	+0.0	21.3	54.0	-32.7	Horiz

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **AIT**
Specification: **FCC B 15.111**
Work Order #: **75638**
Test Type: **Maximized Emissions**
Equipment: **Reader**
Manufacturer: **AIT**
Model: **L-RX100**
S/N: **402354**

Date: 12/01/2000
Time: 12:28:16
Sequence#: 5
Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Reader*	AIT	L-RX100	402354

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	HP	6205C	2228A01775
Computer	IBM	Think Pad 600	78-LD521
Active Tag	AIT	L-TG501	4278612-9

Test Conditions / Notes:

EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply.

Measurement Data: Reading listed by margin. Test Distance: None

#	Freq MHz	Rdng dBμV					Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	846.516M	33.5					+0.0	33.5	50.0	-16.5	None
2	232.123M	28.7					+0.0	28.7	50.0	-21.3	None
3	1692.913M	28.6					+0.0	28.6	50.0	-21.4	None
4	240.105M	28.2					+0.0	28.2	50.0	-21.8	None
5	48.080M	28.1					+0.0	28.1	50.0	-21.9	None
6	218.095M	26.9					+0.0	26.9	50.0	-23.1	None
7	226.117M	26.6					+0.0	26.6	50.0	-23.4	None
8	220.120M	26.5					+0.0	26.5	50.0	-23.5	None
9	228.117M	26.3					+0.0	26.3	50.0	-23.7	None
10	260.093M	26.2					+0.0	26.2	50.0	-23.8	None
11	224.105M	25.9					+0.0	25.9	50.0	-24.1	None
12	182.108M	25.8					+0.0	25.8	50.0	-24.2	None
13	216.124M	25.7					+0.0	25.7	50.0	-24.3	None

14	74.103M	25.7	+0.0	25.7	50.0	-24.3	None
15	204.111M	25.5	+0.0	25.5	50.0	-24.5	None
16	196.081M	25.5	+0.0	25.5	50.0	-24.5	None
17	54.070M	25.5	+0.0	25.5	50.0	-24.5	None
18	56.110M	25.3	+0.0	25.3	50.0	-24.7	None
19	212.103M	25.2	+0.0	25.2	50.0	-24.8	None
20	64.031M	25.1	+0.0	25.1	50.0	-24.9	None
21	120.062M	25.1	+0.0	25.1	50.0	-24.9	None
22	234.121M	25.0	+0.0	25.0	50.0	-25.0	None
23	236.109M	24.9	+0.0	24.9	50.0	-25.1	None
24	96.101M	24.9	+0.0	24.9	50.0	-25.1	None
25	94.106M	24.7	+0.0	24.7	50.0	-25.3	None
26	230.149M	24.6	+0.0	24.6	50.0	-25.4	None
27	91.147M	24.5	+0.0	24.5	50.0	-25.5	None
28	192.086M	24.3	+0.0	24.3	50.0	-25.7	None
29	198.112M	24.1	+0.0	24.1	50.0	-25.9	None
30	190.106M	24.0	+0.0	24.0	50.0	-26.0	None
31	86.060M	24.0	+0.0	24.0	50.0	-26.0	None
32	188.081M	23.6	+0.0	23.6	50.0	-26.4	None

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **AIT**
 Specification: **FCC B RADIATED**
 Work Order #: **75638**
 Test Type: **Radiated Scan**
 Equipment: **Reader**
 Manufacturer: **AIT**
 Model: **L-RX100**
 S/N: **402354**

Date: 12/01/2000
 Time: 17:26:04
 Sequence#: 8
 Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Reader*	AIT	L-RX100	402354

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	HP	6205C	2228A01775
Computer	IBM	Think Pad 600	78-LD521
Active Tag	AIT	L-TG501	4278612-9

Test Conditions / Notes:

EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	Amp dB	Bicon dB	Log dB	Cable dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	338.690M	40.7	-25.0	+0.0	+19.3	+3.9	+0.0	38.9	46.0	-7.1	Vert
2	890.318M	34.1	-25.7	+0.0	+23.4	+6.7	+0.0	38.5	46.0	-7.5	Horiz
^	890.303M	38.3	-25.7	+0.0	+23.4	+6.7	+0.0	42.7	46.0	-3.3	Horiz
4	378.620M	41.3	-25.3	+0.0	+17.4	+4.0	+0.0	37.4	46.0	-8.6	Vert
5	318.763M	37.8	-24.9	+0.0	+20.4	+3.8	+0.0	37.1	46.0	-8.9	Vert
6	74.099M	46.6	-25.0	+7.8	+0.0	+1.6	+0.0	31.0	40.0	-9.0	Horiz
7	56.003M	43.1	-24.9	+10.1	+0.0	+1.5	+0.0	29.8	40.0	-10.2	Vert
8	54.024M	43.1	-24.9	+10.2	+0.0	+1.4	+0.0	29.8	40.0	-10.2	Vert
9	358.670M	38.4	-25.1	+0.0	+18.3	+3.9	+0.0	35.5	46.0	-10.5	Vert
10	58.014M	42.3	-24.9	+10.1	+0.0	+1.5	+0.0	29.0	40.0	-11.0	Vert
11	331.417M	36.3	-24.9	+0.0	+19.7	+3.8	+0.0	34.9	46.0	-11.1	Horiz
12	398.410M	39.7	-25.5	+0.0	+16.5	+4.1	+0.0	34.8	46.0	-11.2	Vert
13	329.942M	35.5	-24.9	+0.0	+19.8	+3.8	+0.0	34.2	46.0	-11.8	Horiz

14	330.277M	35.1	-24.9	+0.0	+19.8	+3.8	+0.0	33.8	46.0	-12.2	Horiz
15	333.320M	35.1	-24.9	+0.0	+19.6	+3.8	+0.0	33.6	46.0	-12.4	Vert
16	72.076M	43.0	-25.0	+7.9	+0.0	+1.6	+0.0	27.5	40.0	-12.5	Horiz
17	416.890M	37.4	-25.5	+0.0	+16.6	+4.3	+0.0	32.8	46.0	-13.2	Vert
18	56.096M	40.0	-24.9	+10.1	+0.0	+1.5	+0.0	26.7	40.0	-13.3	Horiz
19	58.112M	39.9	-24.9	+10.1	+0.0	+1.5	+0.0	26.6	40.0	-13.4	Horiz
20	54.072M	39.6	-24.9	+10.2	+0.0	+1.4	+0.0	26.3	40.0	-13.7	Horiz
21	372.062M	35.5	-25.2	+0.0	+17.7	+4.0	+0.0	32.0	46.0	-14.0	Horiz
22	438.110M	35.8	-25.6	+0.0	+16.8	+4.5	+0.0	31.5	46.0	-14.5	Vert
23	144.018M	37.9	-24.9	+13.7	+0.0	+2.3	+0.0	29.0	43.5	-14.5	Vert
24	398.483M	36.3	-25.5	+0.0	+16.5	+4.1	+0.0	31.4	46.0	-14.6	Horiz
25	240.087M	36.1	-24.6	+16.8	+0.0	+3.1	+0.0	31.4	46.0	-14.6	Horiz
26	74.002M	40.9	-25.0	+7.8	+0.0	+1.6	+0.0	25.3	40.0	-14.7	Vert
27	336.123M	32.4	-24.9	+0.0	+19.5	+3.8	+0.0	30.8	46.0	-15.2	Horiz
28	438.653M	34.6	-25.6	+0.0	+16.9	+4.5	+0.0	30.4	46.0	-15.6	Horiz
29	48.072M	37.1	-24.9	+10.7	+0.0	+1.3	+0.0	24.2	40.0	-15.8	Horiz
30	348.071M	31.3	-25.0	+0.0	+18.9	+3.9	+0.0	29.1	46.0	-16.9	Horiz
31	170.057M	33.4	-24.8	+15.2	+0.0	+2.5	+0.0	26.3	43.5	-17.2	Horiz
32	408.119M	33.1	-25.5	+0.0	+16.5	+4.2	+0.0	28.3	46.0	-17.7	Vert
33	168.081M	33.1	-24.8	+15.0	+0.0	+2.5	+0.0	25.8	43.5	-17.7	Horiz
34	150.095M	34.8	-24.9	+13.2	+0.0	+2.3	+0.0	25.4	43.5	-18.1	Horiz
35	432.145M	32.2	-25.6	+0.0	+16.8	+4.4	+0.0	27.8	46.0	-18.2	Vert
36	144.087M	32.2	-24.9	+13.7	+0.0	+2.3	+0.0	23.3	43.5	-20.2	Horiz

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **AIT**
Specification: **FCC B RADIATED**
Work Order #: **75638**
Test Type: **Radiated Scan**
Equipment: **Reader**
Manufacturer: **AIT**
Model: **L-RX100**
S/N: **402354**

Date: 12/01/2000
Time: 17:49:11
Sequence#: 9
Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Reader*	AIT	L-RX100	402354

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	HP	6205C	2228A01775
Computer	IBM	Think Pad 600	78-LD521
Active Tag	AIT	L-TG501	4278612-9

Test Conditions / Notes:

EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBuV	Amp Cable dB	Horn dB	Cable dB	Cable dB	Dist Table	Corr dBuV/m	Spec dBuV/m	Margin dB	Polar Ant
1	1955.354M	47.5	-35.3 +2.2	+26.4	+0.2	+4.2	+0.0	45.2	54.0	-8.8	Vert
2	1963.190M	47.0	-35.3 +2.2	+26.4	+0.2	+4.2	+0.0	44.7	54.0	-9.3	Horiz
3	1951.350M	46.7	-35.3 +2.2	+26.4	+0.2	+4.1	+0.0	44.3	54.0	-9.7	Vert
4	1955.290M	46.1	-35.3 +2.2	+26.4	+0.2	+4.2	+0.0	43.8	54.0	-10.2	Horiz
5	1085.663M	45.2	-35.9 +1.6	+24.0	+0.3	+3.0	+0.0	38.2	54.0	-15.8	Vert

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **AIT**
 Specification: **FCC B COND**
 Work Order #: **75638**
 Test Type: **Conducted Emissions**
 Equipment: **Reader**
 Manufacturer: **AIT**
 Model: **L-RX100**
 S/N: **402354**

Date: 12/01/2000
 Time: 12:43:54
 Sequence#: 6
 Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Reader*	AIT	L-RX100	402354

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	HP	6205C	2228A01775
Computer	IBM	Think Pad 600	78-LD521
Active Tag	AIT	L-TG501	4278612-9

Test Conditions / Notes:

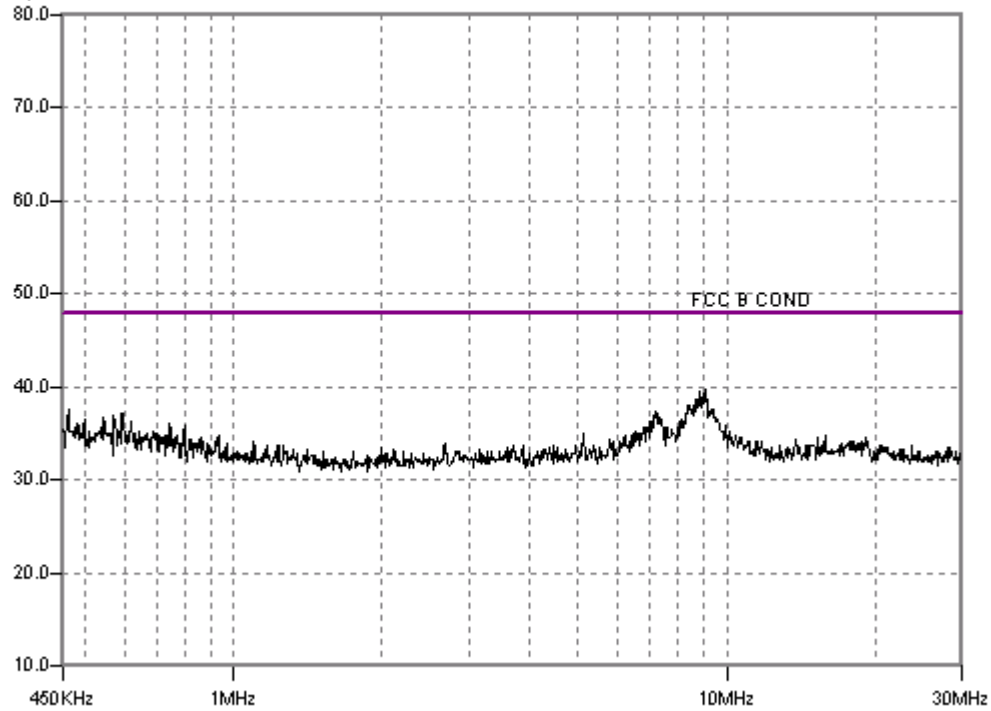
EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply. Support computer powered through support LISN.

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBμV	LISN		Cable		Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
			dB	dB	dB	dB					
1	9.098M	34.5	+0.2	+5.1			+0.0	39.8	48.0	-8.2	Black
2	8.811M	34.6	+0.2	+4.8			+0.0	39.6	48.0	-8.4	Black
3	8.988M	33.5	+0.2	+5.5			+0.0	39.2	48.0	-8.8	Black
4	8.906M	33.5	+0.2	+5.2			+0.0	38.9	48.0	-9.1	Black
5	8.742M	34.0	+0.2	+4.5			+0.0	38.7	48.0	-9.3	Black
6	8.647M	34.3	+0.2	+4.2			+0.0	38.7	48.0	-9.3	Black
7	8.551M	34.1	+0.2	+3.8			+0.0	38.1	48.0	-9.9	Black
8	8.401M	34.7	+0.2	+3.2			+0.0	38.1	48.0	-9.9	Black
9	8.333M	34.9	+0.2	+2.9			+0.0	38.0	48.0	-10.0	Black
10	9.391M	33.4	+0.2	+3.9			+0.0	37.5	48.0	-10.5	Black
11	463.386k	36.9	+0.1	+0.5			+0.0	37.5	48.0	-10.5	Black
12	7.171M	36.4	+0.2	+0.8			+0.0	37.4	48.0	-10.6	Black
13	594.738k	36.7	+0.1	+0.4			+0.0	37.2	48.0	-10.8	Black

14	572.149k	36.4	+0.1	+0.4	+0.0	36.9	48.0	-11.1	Black
15	458.366k	36.3	+0.1	+0.5	+0.0	36.9	48.0	-11.1	Black
16	7.322M	35.7	+0.2	+0.9	+0.0	36.8	48.0	-11.2	Black
17	542.030k	36.2	+0.1	+0.5	+0.0	36.8	48.0	-11.2	Black
18	7.363M	35.4	+0.2	+1.0	+0.0	36.6	48.0	-11.4	Black
19	8.100M	34.3	+0.2	+2.0	+0.0	36.5	48.0	-11.5	Black
20	498.525k	35.9	+0.1	+0.5	+0.0	36.5	48.0	-11.5	Black

CKC Laboratories, Inc. Date: 12/01/2000 Time: 12:29:20 WO#: 75638
FCC B COND Test Lead: Black Sequence#: 6
dB μ V AIT model L-RX100 powered 120VAC/60Hz via DC power supply



Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **AIT**
 Specification: **FCC B COND**
 Work Order #: **75638**
 Test Type: **Conducted Emissions**
 Equipment: **Reader**
 Manufacturer: **AIT**
 Model: **L-RX100**
 S/N: **402354**

Date: 12/01/2000
 Time: 13:01:03
 Sequence#: 7
 Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Reader*	AIT	L-RX100	402354

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	HP	6205C	2228A01775
Computer	IBM	Think Pad 600	78-LD521
Active Tag	AIT	L-TG501	4278612-9

Test Conditions / Notes:

EUT is an active tag receiver with a detachable antenna powered by a separate DC power supply. Support computer powered through support LISN.

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	LISN		Cable		Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
		Rdng dBµV	dB	dB	dB					
1	7.130M	34.3	+0.2		+3.3	+0.0	37.8	48.0	-10.2	White
2	8.442M	35.8	+0.2		+1.7	+0.0	37.7	48.0	-10.3	White
3	8.223M	35.5	+0.2		+2.0	+0.0	37.7	48.0	-10.3	White
4	7.035M	34.1	+0.2		+3.4	+0.0	37.7	48.0	-10.3	White
5	460.040k	37.0	+0.1		+0.6	+0.0	37.7	48.0	-10.3	White
6	6.857M	34.3	+0.2		+3.1	+0.0	37.6	48.0	-10.4	White
7	8.333M	35.4	+0.2		+1.9	+0.0	37.5	48.0	-10.5	White
8	7.732M	34.6	+0.2		+2.7	+0.0	37.5	48.0	-10.5	White
9	7.568M	34.4	+0.2		+2.8	+0.0	37.4	48.0	-10.6	White
10	464.223k	36.7	+0.1		+0.6	+0.0	37.4	48.0	-10.6	White
11	8.018M	34.7	+0.2		+2.4	+0.0	37.3	48.0	-10.7	White
12	7.328M	34.0	+0.2		+3.1	+0.0	37.3	48.0	-10.7	White
13	6.939M	33.8	+0.2		+3.3	+0.0	37.3	48.0	-10.7	White

14	515.258k	36.4	+0.1	+0.6	+0.0	37.1	48.0	-10.9	White
15	453.347k	36.4	+0.1	+0.6	+0.0	37.1	48.0	-10.9	White
16	7.643M	34.0	+0.2	+2.7	+0.0	36.9	48.0	-11.1	White
17	8.742M	35.3	+0.2	+1.3	+0.0	36.8	48.0	-11.2	White
18	604.778k	35.8	+0.1	+0.6	+0.0	36.5	48.0	-11.5	White
19	496.852k	35.7	+0.1	+0.6	+0.0	36.4	48.0	-11.6	White
20	475.936k	35.6	+0.1	+0.6	+0.0	36.3	48.0	-11.7	White

CKC Laboratories, Inc. Date: 12/01/2000 Time: 12:57:04 WO#: 75638
FCC B COND Test Lead: White Sequence#: 7
dBµV AIT model L-RX100 powered 120VAC/60Hz via DC power supply

