FCC PART 15, SUBPART C
TEST REPORT

for

TRANSMITTER
Model: KTX433
FCC ID: QY4KTX433

Prepared for

APPLIED WIRELESS
1250 AVENIDA ACASO UNIT F
CAMARILLO, CA 93012

Prepared by: 

JOEY J. MADLANGBAYAN

Approved by: 

RUBY A. HALL

COMPATIBLE ELECTRONICS INC.
2337 TROUTDALE DRIVE
AGOURA, CALIFORNIA 91301
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DATE: APRIL 9, 2003

	REPORT BODY	APPENDICES					TOTAL
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GENERAL REPORT SUMMARY

This electromagnetic emission report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form except in full, without the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: Transmitter
Model: KTX433
S/N: None

Product Description: This is a Transmitter.

Modifications: The EUT was not modified during the testing.

Manufacturer: Applied Wireless
1250 Avenida Acaso Unit F
Camarillo, CA 93012

Test Date: September 19, 2002

Test Specifications: EMI requirements
FCC CFR Title 47, Part 15 Subpart C
Test Procedure: ANSI C63.4: 2000.

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Radiated RF Emissions, 433.92 MHz to 4339.20 MHz	Complies with the limits of FCC CFR Title 47, Part 15 Subpart C 15.205 and 15.231.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Transmitter Model: KTX433. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2000. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined in FCC CFR Title 47, Part 15 Subpart C (15.205 and 15.231).

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 2337 Troutdale Drive, Agoura, California 91301.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Applied Wireless

David Nichols	President
Mark Simon	Vice President of Engineering

Compatible Electronics Inc.

Andre D. Khan	Test Technician
Joey J. Madlangbayan	Test Engineer
Ruby A. Hall	Lab Manager

2.4 Date Test Sample was Received

The test sample was received on September 19, 2002.

2.5 Disposition of the Test Sample

The test sample remains at Compatible Electronics, Inc.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC CFR Title 47, Part 15 Subpart C.	FCC Rules – Intentional Radiators.
ANSI C63.4 2000	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

The EUT was set-up in a tabletop configuration continuously transmitting a signal. A DC power supply was connected to the EUT in order to power the unit and to simulate a fresh battery.

The highest emissions were found when the EUT was running in the above configuration. The final radiated data was taken in this mode of operation. All initial investigations were performed with the spectrum analyzer in manual mode scanning the frequency range continuously. The EUT was setup and tested as shown in the photographs in Appendix D.

4.1.1 Cable Construction and Termination

There are no external data cables connected to the EUT.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER
TRANSMITTER (EUT)	APPLIED WIRELESS	KTX433	FCC ID: QY4KTX433
DC POWER SUPPLY	HEWLETT PACKARD	6824A	2227A-03324

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer	Hewlett Packard	8566A	1904A00188	Jan. 28, 2002	Jan. 28, 2003
Quasi-Peak Adapter	Hewlett Packard	85650A	2043A00276	Jan. 28, 2002	Jan. 28, 2003
Preamplifier	Com Power	CPPA-102	01249	Mar. 25, 2002	Mar. 25, 2003
Log Periodic Antenna	Com Power	AL-100	01116	Mar. 06, 2001	Mar. 06, 2002
Horn Antenna	A. R. A.	DRG 118/A	1015	Dec. 18, 2001	Dec. 18, 2000
Microwave Amplifier	Com Power	PA-122	181915	Jun. 12, 2002	Jun. 12, 2003
Antenna Mast	Com Power	AM-400	N/A	N/A	N/A
Turntable	Com Power	TT-106A	N/A	N/A	N/A
Computer	Hewlett Packard	Pavilion 4530	US91912022	N/A	N/A
Printer	Hewlett Packard	C6427B	MY066160TW	N/A	N/A
(Software) Radiated Emissions Transmitter Data Program	Compatible Electronics	DOC No: EMI_PART15TX-B-0-50	Rev. A	N/A	N/A

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The Spectrum Analyzer was used as a measuring meter along with the quasi-peak adapter. The data was collected with the Spectrum Analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the Spectrum Analyzer input stage, and the Spectrum Analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the Spectrum Analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2000. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequency ranges of 0.15 MHz to 1.6 MHz, 1.6 MHz to 5 MHz and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

The EUT is a DC-powered unit; therefore this test was not performed.

7.1.2 Radiated Emissions Test

The spectrum analyzer was used as a measuring meter along with a quasi-peak adapter. A Preamplifier was used to increase the sensitivity of the instrument. The Spectrum Analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps. This final reading is then recorded into the a Computer data recording program, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. The quasi-peak adapter was used only for those readings, which are marked accordingly on the data sheets. The effective measurement bandwidth used for the radiated emissions test was according to the frequency measured (200 Hz for 10kHz-150kHz, 9 kHz for 0.150kHz-30MHz, 120 kHz for 30-1000MHz and 1 MHz for 1000MHz and above).

Broadband log periodic and horn antennas were used as transducers during the measurement. The log periodic antenna was used from 300 MHz to 1 GHz and the horn antenna was used from 1 GHz to 4.339 GHz. The frequency spans were wide (300 MHz to 1 GHz and 1 GHz to 4.339 GHz) during preliminary investigations. The final data was taken with a frequency span of 1 MHz. Furthermore, the frequency span was reduced during the preliminary investigations as deemed necessary.

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2000. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

Preliminary Testing and Monitoring:

Preliminary testing was done at a distance of 1 meter instead of 3 meters to determine the predominant harmonics and spurious emission frequencies. An open field test site was used for the preliminary investigations. Broadband antennas were used to scan large frequency bands while manipulating the X, Y, and Z azimuth of the unit. If and when any frequency was found to be above 30 microvolts/meter level (at 1 meter distance), this frequency was recorded as a significant frequency. All significant frequencies were further examined carefully at a reduced frequency span on the spectrum analyzer while changing the antenna height and EUT orientation. The EUT was tested again at a 3 meter test distance to obtain the final test data. The bandwidth of the spectrum analyzer was varied to ensure that pulse desensitization did not occur.

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final test data. The test data is located in Appendix E.

Final Radiated Test

The frequency bands listed in paragraph (a) Section 15.205 were specifically scanned to detect the presence of any spurious emissions from the EUT (Spurious Emissions in frequency bands listed in Para. (a) Section 15.205). The results are listed in table 1.

The bandwidth of the emissions was measured at 20 dB points and is given in table 2.0 (Emissions Bandwidth as per Paragraph (c) of Section 15.231).

7.1.3 RF Emissions Test Results

The fundamental and up to the 10th harmonic emissions are within the specifications.

APPLIED WIRELESS
TRANSMITTER MN: KTX433

Table 1.0

RADIATED EMISSIONS – SPURIOUS
RF LOW POWER TRANSMITTER

The following bands were specifically scanned.
433.92 MHz – 4.339 GHz.
The 433.92 MHz is the lowest frequency generated and does not get divided down to any other frequency.
No spurious emissions were found.

RF Energy From Transmitter in MHz at 3 meters (μV/m)

608-614	<200
960-1240	<500
1300-1427	<500
1435-1626.5	<500
1645.5-1646.5	<500
1660-1710	<500
1718.8-1722.2	<500
2200-2300	<500
2310-2390	<500
2483.5-2500	<500
2655-2900	<500
3260-3267	<500
3332-3339	<500
3345.8-3358	<500
3600-4400	<500

Table 2.0 RADIATED EMISSIONS - BANDWIDTH
RF LOW POWER TRANSMITTER

The bandwidth of the emission (20 dB points from modulated carrier) was less than 0.25% of the 433.92 MHz Center Frequency and was measured as 374 kHz. See Appendix E for plot.

7.1.4 Sample Calculations

The Preamplifier was used to increase the sensitivity of the spectrum analyzer. A correction factor for the antenna, preamplifier, cable loss and a distance factor (if any), must be applied to the meter reading before a true field strength reading can be obtained. For greater efficiency and convenience, instead of using these correction factors for each meter reading, the specification limit was modified to reflect these correction factors at each frequency, so that the meter readings can be compared directly to the modified specification limit, referred to henceforth as the corrected meter reading limit (CML).

The equation can be derived in the following manner:

Corrected Meter Reading = meter reading + F - G

where: F = antenna factor
G = effective gain (amplifier gain - cable loss)

Therefore, the equation for determining the corrected meter reading limit is:

CML = spec. limit - F + G

A table of corrected meter reading limits was used to permit immediate comparison of the meter reading and determine if the emission level exceeded the specification limit at that frequency. The correction factors for the antenna and the effective gain are attached in Appendix C of this report. The data sheets are attached in Appendix A.

The distance factor D is 0 when the test is performed at a distance of 3 meters.

8. CONCLUSIONS

The Transmitter Model: KTX433 meets all of the requirements of the FCC CFR, Title 47, Part 15, Subpart C 15.205 and 15.231.

APPENDIX A

LABORATORY ACCREDITATIONS

LABORATORY ACCREDITATIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200063-0

Voluntary Control Council for Interference - Registration Numbers: R-826, C-862, R-653 and C-669

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

Conformity Assessment Body for the EMC directive under the US/EU MRA appointed by NIST.

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

There were no modifications made to the EUT during the test.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

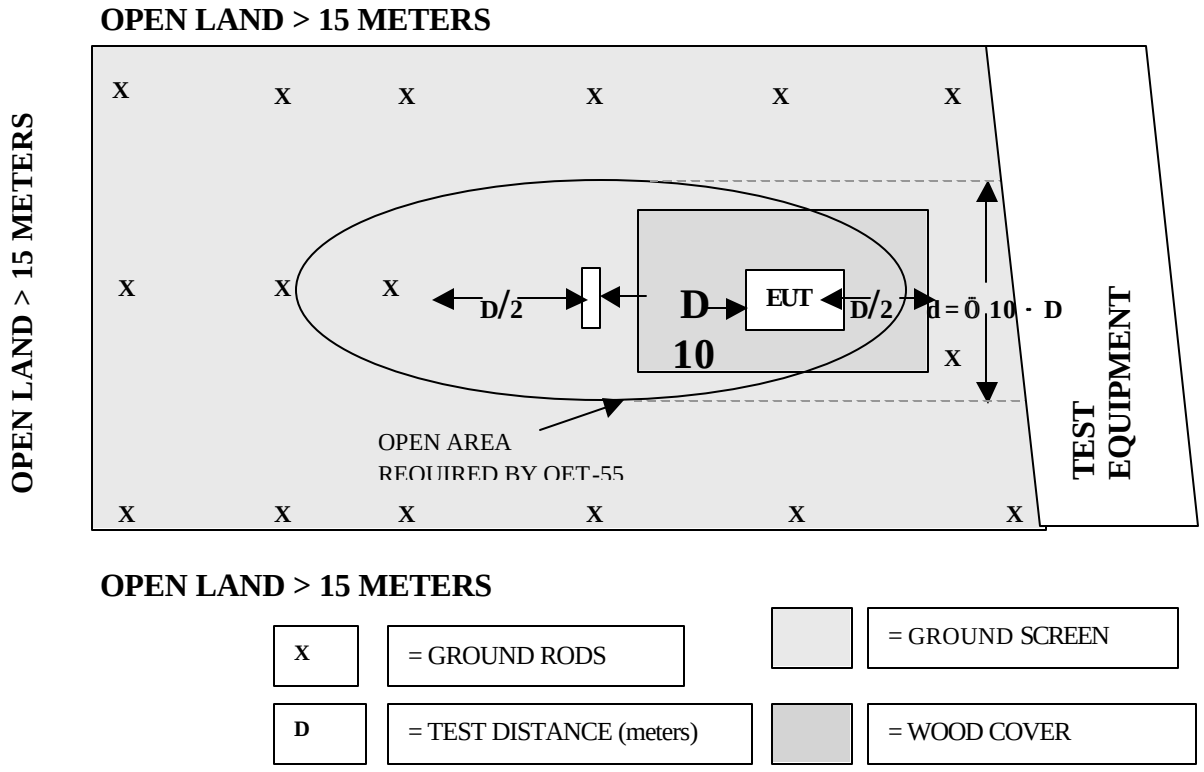
USED FOR THE PRIMARY TEST TRANSMITTER
Model: KTX433

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED SITE



COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 01116

CALIBRATION DATE: MARCH 6, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	11.70	700	19.80
400	11.80	800	22.40
500	15.90	900	22.20
600	17.30	1000	23.60

COM-POWER PA-102

PREAMPLIFIER

S/N: 1249

CALIBRATION DATE: MARCH 25, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	36.7	300	36.0
40	36.8	350	35.9
50	36.7	400	36.0
60	36.6	450	35.5
70	36.5	500	35.7
80	36.7	550	36.2
90	36.6	600	35.4
100	36.6	650	35.7
125	36.4	700	36.3
150	36.4	750	35.0
175	36.2	800	35.1
200	36.2	850	35.1
225	36.2	900	33.5
250	36.1	950	32.7
275	36.0	1000	32.3

COM-POWER PA-122

PREAMPLIFIER

S/N: 181915

CALIBRATION DATE: JUNE 12, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	32.8	7000	32.8
1100	32.8	7500	32.7
1200	32.7	8000	32.2
1300	32.6	8500	31.4
1400	32.7	9000	32.3
1500	32.8	9500	31.4
1600	32.5	10000	31.4
1700	32.2	11000	33.2
1800	27.0	12000	33.6
1900	29.2	13000	32.2
2000	29.7	14000	32.8
2500	33.0	15000	32.0
3000	33.3	16000	33.0
3500	33.6	17000	33.5
4000	33.3	18000	33.4
4500	33.3		
5000	33.1		
5500	33.0		
6000	33.1		
6500	32.8		

A.R.A DRG-118/A

HORN ANTENNA

S/N: 1015

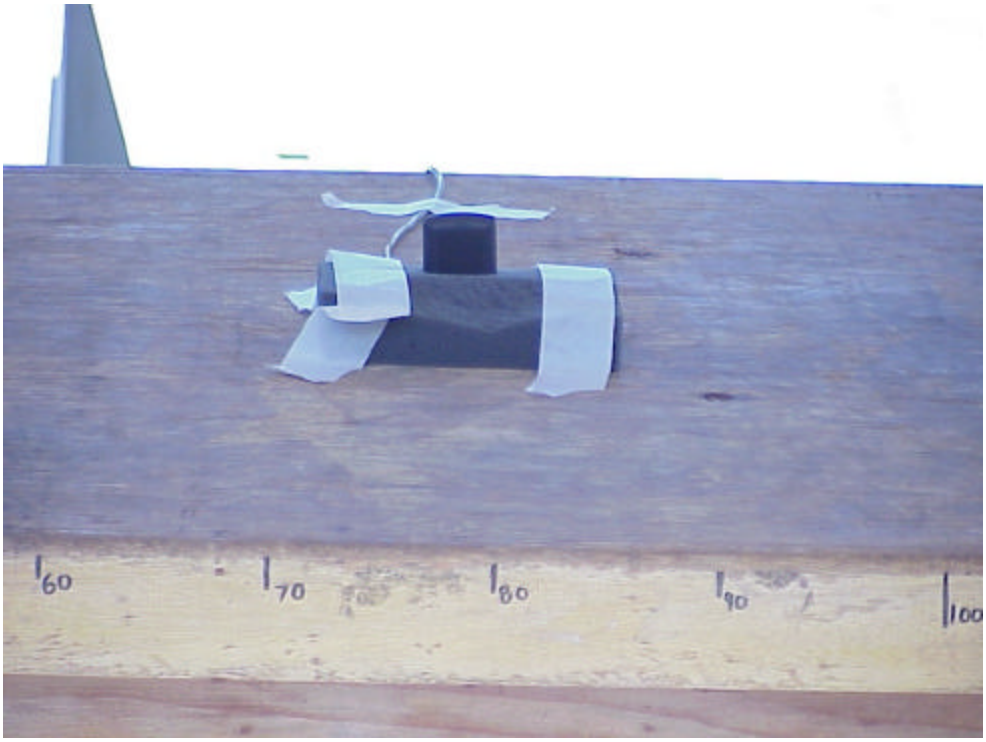
CALIBRATION DATE: DECEMBER 18, 2001

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	25.8	10000	41.3
1500	26.9	10500	42.1
2000	30.9	11000	42.2
2500	30.2	11500	43.6
3000	31.8	12000	44.0
3500	32.4	12500	42.2
4000	31.9	13000	40.7
4500	31.6	13500	40.9
5000	33.3	14000	39.7
5500	31.8	14500	44.7
6000	38.2	15000	42.4
6500	38.2	15500	45.1
7000	38.3	16000	42.8
7500	38.4	16500	42.6
8000	39.5	17000	45.9
8500	38.8	17500	49.2
9000	40.9	18000	42.4
9500	40.2		

FRONT

APPLIED WIRELESS
TRANSMITTER
Model: KTX433
FCC PART 15 SUBPART C - RADIATED EMISSIONS – 9-19-02

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR

APPLIED WIRELESS
TRANSMITTER
Model: KTX433
FCC PART 15 SUBPART C - RADIATED EMISSIONS – 9-19-02

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

EUT AND LAB INFORMATION

COMPANY:	Applied Wireless
EUT NAME:	433.92 MHz Transmitter
EUT MODEL:	KTX433
EUT S/N:	None
EUT MODE:	TRANSMIT
LOW CHANNEL (MHz):	433.92
MEDIUM CHANNEL (MHz):	
HIGH CHANNEL (MHz):	
FULL BANDWIDTH (MHz):	11.76
DUTY CYCLE %	35%
LEAVE BLANK FOR 3 AXIS	0
LAB:	F
TEST DATE:	9/19/02
DATA SHEET TITLE:	RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)
TEST ENGINEER:	Andre D. Khan
TEST DISTANCE:	3 METERS

ENTER "0" IF THERE IS NO DUTY CYCLE PERCENTAGE

ENTER "0" IF TESTING ONLY ONE AXIS

LAB FACTORS (CHANNEL 1)

FREQ. (MHz)					CABLE LOSS	PREAMP GAIN	ANT. FACTORS
.01-30 S/N CAL DUE							
30-300 S/N CAL DUE					RG-8/U 3548 3/28/03	PA-102 1249 3/25/03	AB-100 1535 3/26/03
300-1000 S/N CAL DUE					RG-8/U 3548 3/28/03	PA-102 1249 3/25/03	AL-100 1116 3/6/03
1G-13G S/N CAL DUE					FSJ1-50 3567 4/16/03	PA-122 3580 6/12/03	DRG-118A 1015 12/18/02
13G-18G S/N CAL DUE					FSJ1-50 3567 4/16/03	PA-122 3580 6/12/03	DRG-118A 1015 12/18/02
18G-26.5G S/N CAL DUE	RESTRICTED? PEAK	RESTRICTED? BAND	A or QP	SPEC LIMIT (dBuV/m)			
433.92	0	0	QP	80.8	5.2	35.7	13.2
867.84	0	0	QP	60.8	7.8	34.5	22.3
1301.76	1	0	A	53.9	4.7	32.6	26.5
1735.68	0	0	A	60.8	5.4	30.4	28.8
2169.60	0	0	A	60.8	6.1	30.8	30.7
2603.52	0	0	A	60.8	6.6	33.1	30.5
3037.44	0	0	A	60.8	7.6	33.3	31.8
3471.36	0	0	A	60.8	7.2	33.6	32.4
3905.28	1	0	A	53.9	8.5	33.4	32.0
4339.20	1	0	A	53.9	8.0	33.3	31.7

LAB FACTORS (CHANNEL 2)

FREQ. (MHz)					CABLE LOSS	PREAMP GAIN	ANT. FACTORS
.01-30 S/N CAL DUE							
30-300 S/N CAL DUE							
300-1000 S/N CAL DUE							
1G-13G S/N CAL DUE							
13G-18G S/N CAL DUE							
18G-26.5G S/N CAL DUE	RESTRICTED? PEAK	RESTRICTED? BAND	A or QP	SPEC LIMIT (dBuV/m)			
0.00	#N/A	#N/A	QP	94.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			

LAB FACTORS (CHANNEL 3)

FREQ. (MHz)					CABLE LOSS	PREAMP GAIN	ANT. FACTORS
.01-30 S/N CAL DUE							
30-300 S/N CAL DUE							
300-1000 S/N CAL DUE							
1G-13G S/N CAL DUE							
13G-18G S/N CAL DUE							
18G-26.5G S/N CAL DUE	RESTRICTED? PEAK	RESTRICTED? BAND	A or QP	SPEC LIMIT (dBuV/m)			
0.00	#N/A	#N/A	QP	94.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			
0.00	#N/A	#N/A	A	54.0			

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
433.9200	99.4	90.3 QP	H	3.0	170			13.2	5.2	35.7	**73.0**	**-7.8**	**80.8**	
433.9200	97.7	88.6 QP	V	1.0	180			13.2	5.2	35.7	**71.3**	**-9.5**	**80.8**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
867.8400	70.8	61.5 QP	H	3.0	170			22.3	7.8	34.5	**57.1**	**-3.7**	**60.8**	
867.8400	59.3	QP	V	1.5	160			22.3	7.8	34.5	**54.9**	**-5.9**	**60.8**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1301.7600	48.1	A	H	2.0	170			26.5	4.7	32.6	**46.6**	**-7.3**	**53.9**	
1301.7600	46.2	A	V	1.0	180			26.5	4.7	32.6	**44.8**	**-9.1**	**53.9**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1301.7600	48.1	A	H	2.0	170			26.5	4.7	32.6	**46.6**	**-7.3**	**53.9**	
1301.7600	46.2	A	V	1.0	180			26.5	4.7	32.6	**44.8**	**-9.1**	**53.9**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1735.6800	53.5	A	H	3.0	170			28.8	5.4	30.4	**57.3**	**-3.5**	**60.8**	
1735.6800	52.3	A	V	1.5	180			28.8	5.4	30.4	**56.1**	**-4.7**	**60.8**	

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** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2169.6000	49.0	A	H	3.0	160			30.7	6.1	30.8	**55.0**	**-5.8**	**60.8**	
2169.6000	47.2	A	V	1.0	180			30.7	6.1	30.8	**53.2**	**-7.6**	**60.8**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2603.5200	45.5	A	H	180.0	2			30.5	6.6	33.1	**49.6**	**-11.2**	**60.8**	
2603.5200	44.1	A	V	180.0	1			30.5	6.6	33.1	**48.2**	**-12.6**	**60.8**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3037.4400	45.3	A	H	2.5	180			31.8	7.6	33.3	**51.4**	**-9.5**	**60.8**	
3037.4400	43.5	A	V	1.0	160			31.8	7.6	33.3	**49.6**	**-11.3**	**60.8**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3471.3600	46.1	A	H	2.5	180			32.4	7.2	33.6	**52.1**	**-8.7**	**60.8**	
3471.3600	44.5	A	V	1.5	160			32.4	7.2	33.6	**50.5**	**-10.3**	**60.8**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3905.2800	53.2	44.1 A	H	3.0	180			32.0	8.5	33.4	**51.2**	**-2.7**	**53.9**	
3905.2800	50.3	41.2 A	V	1.0	160			32.0	8.5	33.4	**48.3**	**-5.6**	**53.9**	

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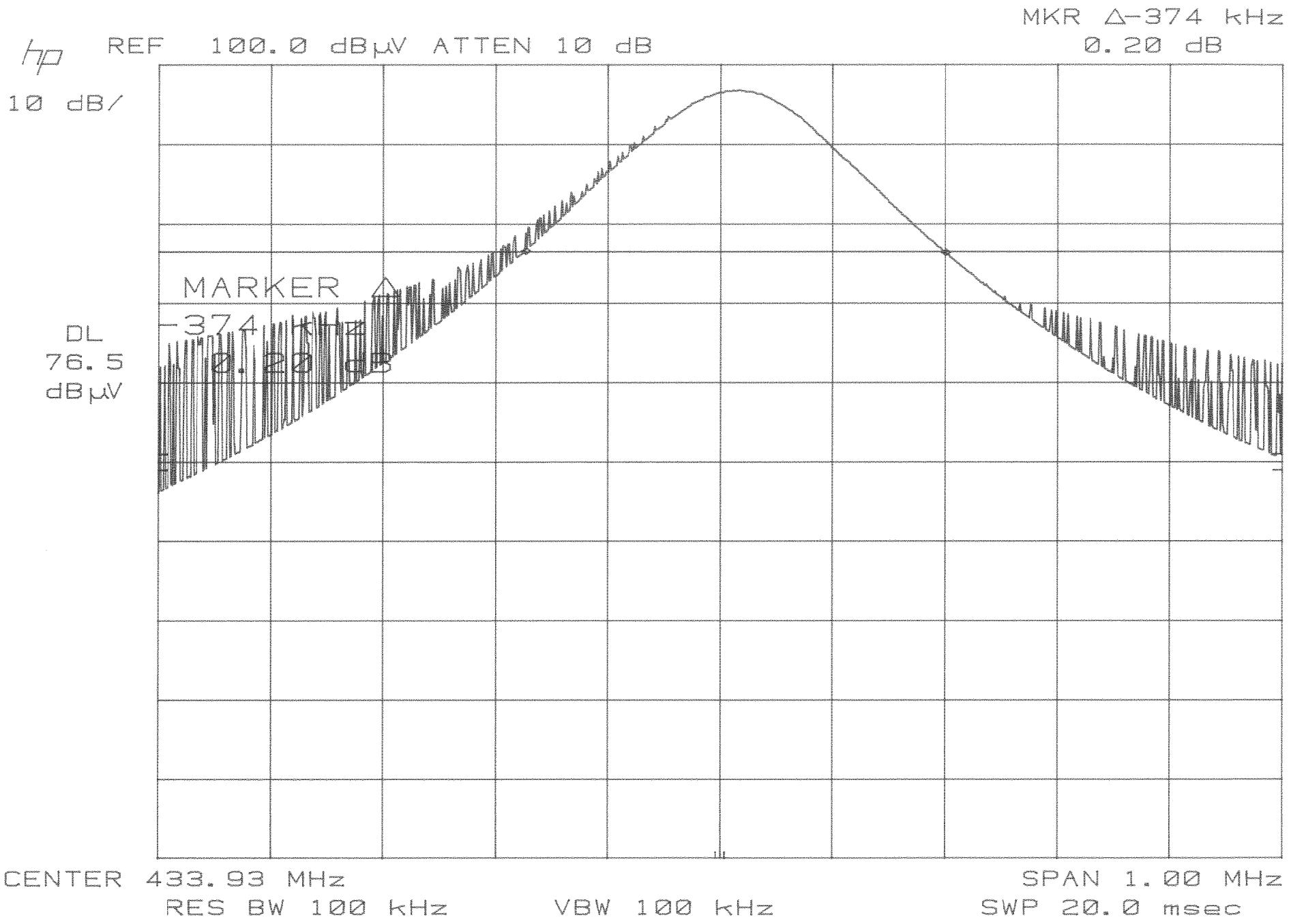
** DELTA = SPEC LIMIT - CORRECTED READING

RADIATED EMISSIONS (FCC SECTION 15.231 AND 15.205)

COMPANY	**Applied Wireless**	**DATE**	**9/19/02**
EUT	**433.92 MHz Transmitter**	**DUTY CYCLE**	**35.00 %**
MODEL	**KTX433**	**PEAK TO AVG**	**-9.12 dB**
S/N	**None**	**TEST DIST.**	**3 METERS**
TEST ENGINEER	**Andre D. Khan**	**LAB**	**F**

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi-Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
4339.2000	52.5	43.4 A	H	3.0	180			31.7	8.0	33.3	**49.7**	**-4.2**	**53.9**	
4339.2000	49.1	40.0 A	V	1.0	160			31.7	8.0	33.3	**46.3**	**-7.6**	**53.9**	

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN
** DELTA = SPEC LIMIT - CORRECTED READING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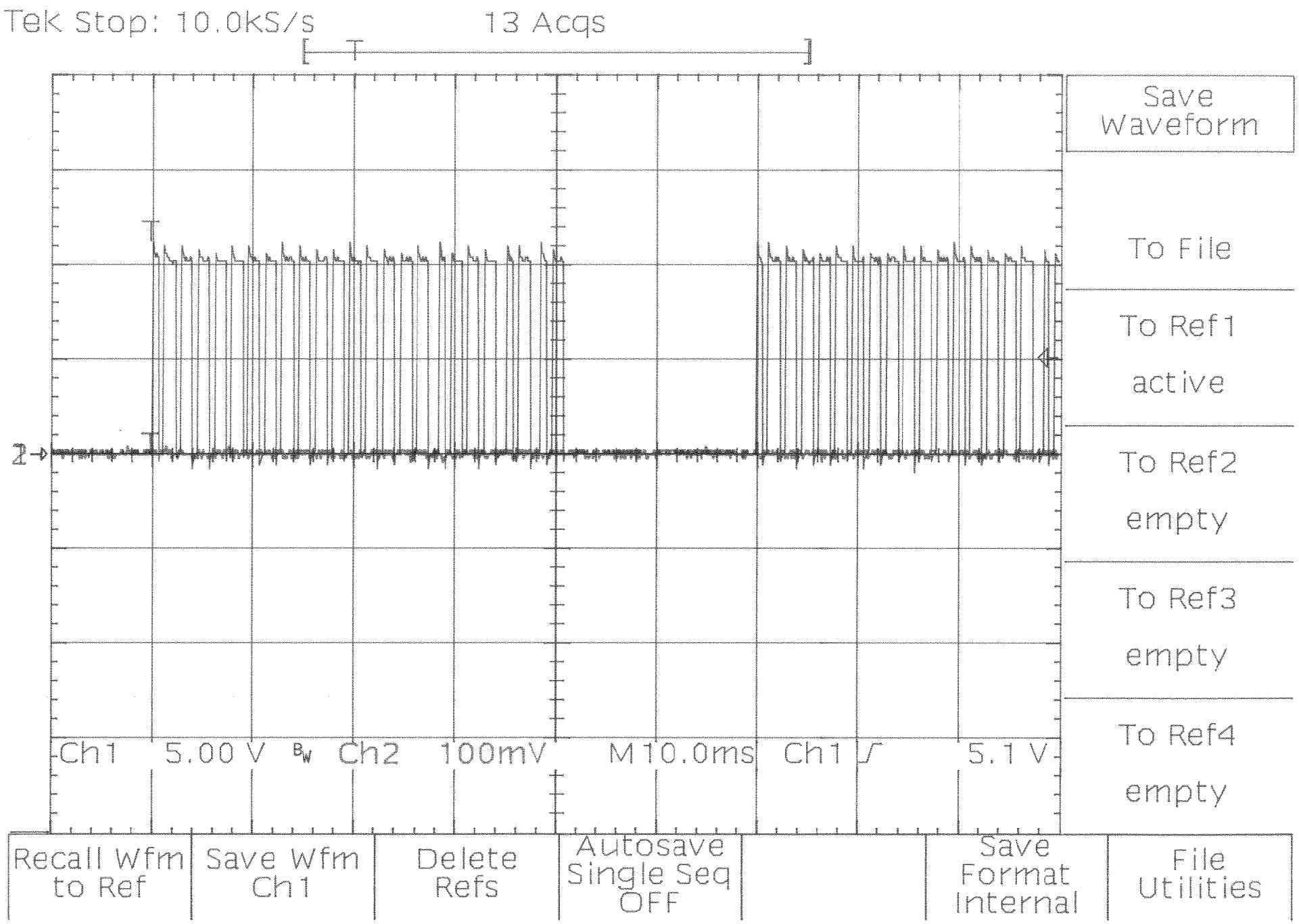
REF 100.0 dBμV ATTEN 10 dB
10 dB/
MARKER
-374 kHz
0.20 dB
DL
76.5
dBμV
CENTER 433.93 MHz
SPAN 1.00 MHz
RES BW 100 kHz
VBW 100 kHz
SWP 20.0 msec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13 Acqs
Save Waveform
To File
To Ref1 active
To Ref2 empty
To Ref3 empty
To Ref4 empty
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Recall Wfm to Ref
Save Wfm Ch1
Delete Refs
Autosave Single Seq OFF
Save Format Internal
File Utilities