

*FCC PART 15, SUBPART B and C
TEST REPORT**for***2-WAY
UNIVERSAL LCD KEYFOB****MODEL: 2WAY-UNIVKF**

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DATE: SEPTEMBER 12, 2003

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	16	2	2	2	10	12	44

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GENERAL REPORT SUMMARY

This electromagnetic emission test 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 without the written permission of Compatible Electronics, unless done so in full.

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

Device Tested: 2-Way Universal LCD Keyfob
Model: 2WAY-UNIVKF
S/N: N/A

Product Description: See Expository Statement

Modifications: The EUT was not modified in order to meet the specifications.

Manufacturer: NAPCO Security Group
333 Bayview Avenue
Amityville, New York 11701

Test Date: May 29, 2003

Test Specifications: EMI requirements
CFR Title 47, Part 15 Subpart B; and Subpart C, Sections 15.205, 15.209, and 15.231

Test Procedure: ANSI C63.4: 2001

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

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz - 30 MHz	This test was not performed because the EUT operates on DC power only and cannot be plugged into the AC public mains.
2	Radiated RF Emissions, 10 kHz - 4400 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231.



1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the 2-Way Universal LCD Keyfob Model: 2WAY-UNIVKF. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2001. 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 Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, 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, 114 Olinda Drive, Brea, California 92823.

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

NAPCO Security Group

Michael A. Carrieri Senior Vice President Engineering

Compatible Electronics, Inc.

Kyle Fujimoto Test Engineer
Michael Christensen Sr. Test Engineer

2.4 Date Test Sample was Received

The test sample was received on May 29, 2003.

2.5 Disposition of the Test Sample

The sample has been returned to NAPCO Security Group on May 29, 2003.

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
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
ANSI C63.4 2001	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

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The 2-Way Universal LCD Keyfob Model: 2WAY-UNIVKF (EUT) was tested as a stand alone device. The EUT was tested in 3 orthogonal axis. The EUT was continuously transmitting. The antenna is soldered directly onto the PCB. During normal operation, the EUT will turn off within 5 seconds of releasing the button.

The final radiated data was taken in the mode above. Please see Appendix E for the data sheets.



4.1.1 Cable Construction and Termination

There are no external cables connected to the EUT.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
2-WAY UNIVERSAL LCD KEYFOB (EUT)	NAPCO SECURITY GROUP	2WAY-UNIVKF	N/A	AD82WAYUNIVKF



5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Radiate Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	June 14, 2002	June 14, 2003
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22279	June 14, 2002	June 14, 2003
Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00424	June 14, 2002	June 14, 2003
Preamplifier	Com Power	PA-102	1017	January 2, 2003	Jan. 2, 2004
Biconical Antenna	Com Power	AB-100	1548	September 19, 2002	Sept. 19, 2003
Log Periodic Antenna	Com Power	AL-100	16089	October 4, 2002	Oct. 4, 2003
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
Loop Antenna	Com-Power	AL-130	17070	June 19, 2002	June 19, 2003
Horn Antenna	Antenna Research	DRG-119/A	1053	January 13, 2002	Jan. 13, 2004
Microwave Preamplifier	Com-Power	PA-122	25195	January 2, 2003	Jan. 2, 2004



6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 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 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, and the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz. 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.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 4.40 GHz	1 MHz	Horn Antenna

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: 2001. 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). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results. The loop antenna was also rotated in the horizontal and vertical axis in order to ensure accurate results.



Radiated Emissions (Spurious and Harmonics) Test (con't)

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 final qualification data sheets are located in Appendix E.



7.2 Bandwidth of the Fundamental

The -20 dB bandwidth was checked to see that it was within 0.25% of the fundamental frequency for the EUT. Plots of the -20 dB bandwidth are located in Appendix E.



8. CONCLUSIONS

The 2-Way Universal LCD Keyfob Model: 2WAY-UNIVKF meets all of the Class B specification limits defined in CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.231.



APPENDIX A

LABORATORY RECOGNITIONS



LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

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

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

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

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)



APPENDIX B

MODIFICATIONS TO THE EUT



MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC 15.231 or FCC Class B specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT.





APPENDIX C

***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***



ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

2-Way Universal LCD Keyfob
Model: 2WAY-UNIVKF
S/N: N/A

There were no additional models covered under this report.



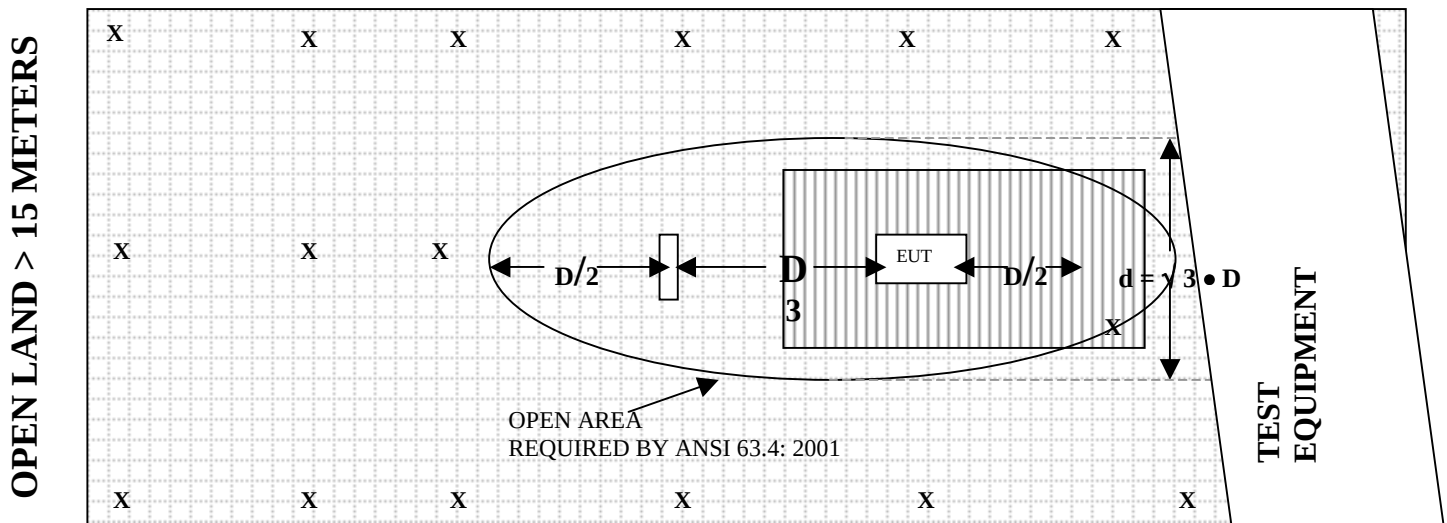
APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS



FIGURE 1: PLOT MAP AND LAYOUT OF RADIATED SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

X	= GROUND RODS		= GROUND SCREEN
D	= TEST DISTANCE (meters)		= WOOD COVER



COM-POWER AB-100

BICONICAL ANTENNA

S/N: 01548

CALIBRATION DATE: SEPTEMBER 19, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	14.30	120	10.70
35	14.00	125	11.40
40	13.70	140	12.70
45	12.00	150	12.50
50	11.40	160	12.90
60	9.70	175	14.10
70	8.30	180	14.70
80	7.60	200	15.10
90	7.80	250	16.90
100	8.60	300	19.10



COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16089

CALIBRATION DATE: OCTOBER 4, 2002

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.10	700	17.70
350	14.40	750	19.60
400	14.30	800	20.50
450	15.70	850	21.20
500	16.60	900	21.20
550	16.60	950	22.50
600	17.30	1000	24.60
650	18.80		



COM-POWER PA-102**PREAMPLIFIER**

S/N: 1017

CALIBRATION DATE: JANUARY 2, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.4	300	38.3
40	38.4	350	38.3
50	38.3	400	38.3
60	38.4	450	37.9
70	38.4	500	38.1
80	38.4	550	38.2
90	38.4	600	38.1
100	38.3	650	37.9
125	38.4	700	37.9
150	38.4	750	37.7
175	38.2	800	37.4
200	38.4	850	37.6
225	38.2	900	37.4
250	38.3	950	36.7
275	38.5	1000	37.0



COM-POWER PA-122**MICROWAVE PREAMPLIFIER**

S/N: 25195

CALIBRATION DATE: JANUARY 2, 2003

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	33.3	6.0	32.2
1.1	33.2	6.5	32.2
1.2	33.4	7.0	31.8
1.3	32.8	7.5	32.1
1.4	32.4	8.0	32.7
1.5	32.7	8.5	31.5
1.6	32.1	9.0	30.3
1.7	32.4	9.5	30.0
1.8	32.3	10.0	31.9
1.9	32.6	11.0	29.9
2.0	33.4	12.0	24.7
2.5	31.2	13.0	32.0
3.0	31.2	14.0	30.7
3.5	32.0	15.0	30.1
4.0	31.3	16.0	29.2
4.5	31.2	17.0	28.9
5.0	33.3	18.0	28.7
5.5	34.0		



ANTENNA RESEARCH DRG-118/A**HORN ANTENNA**

S/N: 1053

CALIBRATION DATE: JANUARY 13, 2002

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	25.5	10.0	39.7
1.5	26.6	10.5	40.9
2.0	29.4	11.0	40.7
2.5	30.4	11.5	42.4
3.0	31.2	12.0	42.6
3.5	32.3	12.5	42.4
4.0	32.9	13.0	41.5
4.5	33.0	13.5	41.0
5.0	34.8	14.0	40.5
5.5	35.2	14.5	43.6
6.0	36.4	15.0	43.7
6.5	36.6	15.5	43.3
7.0	38.8	16.0	42.8
7.5	38.8	16.5	43.0
8.0	38.0	17.0	42.7
8.5	38.1	17.5	44.0
9.0	39.9	18.0	41.8
9.5	39.1		



COM-POWER AL-130**LOOP ANTENNA**

S/N: 17070

CALIBRATION DATE: JUNE 19, 2002

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-40.4	11.1
0.01	-40.3	11.2
0.02	-41.2	10.3
0.05	-41.6	9.9
0.07	-41.4	10.1
0.1	-41.7	9.8
0.2	-44.0	7.5
0.3	-41.6	9.9
0.5	-41.3	10.2
0.7	-41.4	10.1
1	-40.9	10.6
2	-40.6	10.9
3	-40.5	11.0
4	-40.8	10.7
5	-40.2	11.3
10	-40.7	10.8
15	-41.4	10.1
20	-41.6	9.9
25	-41.7	9.8
30	-42.9	8.6





FRONT VIEW

NAPCO SECURITY GROUP
2-WAY UNIVERSAL LCD KEYFOB
MODEL: 2WAY-UNIVKF
FCC SUBPART B AND C - RADIATED EMISSIONS – 05-29-03

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**





REAR VIEW

NAPCO SECURITY GROUP
2-WAY UNIVERSAL LCD KEYFOB
MODEL: 2WAY-UNIVKF
FCC SUBPART B AND C - RADIATED EMISSIONS – 05-29-03

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



APPENDIX E

DATA SHEETS



RADIATED EMISSIONS

DATA SHEETS



RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.231)

COMPANY	NAPCO SECURITY GROUP	DATE	5/29/03
EUT	2-WAY UNIVERSAL LCD KEYFOB	DUTY CYCLE	51.675 %
MODEL	2WAY-UNIVKF	PEAK TO AVG	-5.73439029 dB
S/N	N/A	TEST DIST.	3 Meters
TEST ENGINEER	Kyle Fujimoto	LAB	D

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)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
433.9200	66.9	61.2 A	H	1.0	90	X	LOW	15.2	3.9	0.0	0.0	0.0	80.4	-0.4	80.8	
433.9200	66.5	60.8 A	H	1.0	0	Y	LOW	15.2	3.9	0.0	0.0	0.0	80.0	-0.8	80.8	
433.9200	61.4	55.7 A	H	1.0	0	Z	LOW	15.2	3.9	0.0	0.0	0.0	74.9	-5.9	80.8	
433.9200	56.0	50.3 A	V	1.0	0	X	LOW	15.2	3.9	0.0	0.0	0.0	69.5	-11.3	80.8	
433.9200	66.8	61.1 A	V	1.5	0	Y	LOW	15.2	3.9	0.0	0.0	0.0	80.3	-0.5	80.8	
433.9200	63.4	57.7 A	V	2.0	90	Z	LOW	15.2	3.9	0.0	0.0	0.0	76.9	-3.9	80.8	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.231)

COMPANY	NAPCO SECURITY GROUP	DATE	5/29/03
EUT	2-WAY UNIVERSAL LCD KEYFOB	DUTY CYCLE	51.675 %
MODEL	2WAY-UNIVKF	PEAK TO AVG	-5.73439029 dB
S/N	N/A	TEST DIST.	3 Meters
TEST ENGINEER	Kyle Fujimoto	LAB	D

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)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
867.8400	58.8	53.1 A	H	1.0	270	X	LOW	21.2	5.4	37.5	0.0	0.0	42.1	-18.7	60.8	
867.8400	59.7	54.0 A	H	2.0	0	Y	LOW	21.2	5.4	37.5	0.0	0.0	43.0	-17.8	60.8	
867.8400	54.5	48.8 A	H	1.0	0	Z	LOW	21.2	5.4	37.5	0.0	0.0	37.8	-23.0	60.8	
867.8400	60.0	54.3 A	V	1.0	0	X	LOW	21.2	5.4	37.5	0.0	0.0	43.3	-17.5	60.8	
867.8400	54.7	49.0 A	V	1.0	0	Y	LOW	21.2	5.4	37.5	0.0	0.0	38.0	-22.8	60.8	
867.8400	55.3	49.6 A	V	1.0	90	Z	LOW	21.2	5.4	37.5	0.0	0.0	38.6	-22.2	60.8	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.231)

COMPANY	NAPCO SECURITY GROUP	DATE	5/29/03
EUT	2-WAY UNIVERSAL LCD KEYFOB	DUTY CYCLE	51.675 %
MODEL	2WAY-UNIVKF	PEAK TO AVG	-5.73439029 dB
S/N	N/A	TEST DIST.	3 Meters
TEST ENGINEER	Kyle Fujimoto	LAB	D

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)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1301.7600	44.3	A	H	1.0	0	X	LOW	26.2	1.9	32.8	0.0	0.0	39.6	-14.4	54.0	
1301.7600	44.3	A	H	1.0	90	Y	LOW	26.2	1.9	32.8	0.0	0.0	39.6	-14.4	54.0	
1301.7600	46.3	A	H	1.0	0	Z	LOW	26.2	1.9	32.8	0.0	0.0	41.6	-12.4	54.0	
1301.7600	46.4	A	V	1.0	270	X	LOW	26.2	1.9	32.8	0.0	0.0	41.7	-12.3	54.0	
1301.7600	45.0	A	V	1.0	270	Y	LOW	26.2	1.9	32.8	0.0	0.0	40.3	-13.7	54.0	
1301.7600	44.9	A	V	2.0	0	Z	LOW	26.2	1.9	32.8	0.0	0.0	40.2	-13.8	54.0	

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

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RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.231)

COMPANY	NAPCO SECURITY GROUP	DATE	5/29/03
EUT	2-WAY UNIVERSAL LCD KEYFOB	DUTY CYCLE	51.675 %
MODEL	2WAY-UNIVKF	PEAK TO AVG	-5.73439029 dB
S/N	N/A	TEST DIST.	3 Meters
TEST ENGINEER	Kyle Fujimoto	LAB	D

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)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
1735.6800	49.7	A	H	1.0	0	X	LOW	27.9	2.3	32.4	0.0	0.0	47.6	-13.2	60.8	
1735.6800	49.9	A	H	1.0	270	Y	LOW	27.9	2.3	32.4	0.0	0.0	47.8	-13.0	60.8	
1735.6800	49.5	A	H	1.0	0	Z	LOW	27.9	2.3	32.4	0.0	0.0	47.4	-13.4	60.8	
1735.6800	46.9	A	V	1.0	180	X	LOW	27.9	2.3	32.4	0.0	0.0	44.8	-16.0	60.8	
1735.6800	49.4	A	V	1.0	0	Y	LOW	27.9	2.3	32.4	0.0	0.0	47.3	-13.5	60.8	
1735.6800	52.9	A	V	2.0	90	Z	LOW	27.9	2.3	32.4	0.0	0.0	50.8	-10.0	60.8	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.231)

COMPANY	NAPCO SECURITY GROUP	DATE	5/29/03
EUT	2-WAY UNIVERSAL LCD KEYFOB	DUTY CYCLE	51.675 %
MODEL	2WAY-UNIVKF	PEAK TO AVG	-5.73439029 dB
S/N	N/A	TEST DIST.	3 Meters
TEST ENGINEER	Kyle Fujimoto	LAB	D

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)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2169.6000	45.1	A	H	1.0	0	X	LOW	29.7	3.8	32.7	0.0	0.0	46.0	-14.8	60.8	
2169.6000	43.7	A	H	1.0	0	Y	LOW	29.7	3.8	32.7	0.0	0.0	44.6	-16.2	60.8	
2169.6000	42.9	A	H	1.0	0	Z	LOW	29.7	3.8	32.7	0.0	0.0	43.8	-17.0	60.8	
2169.6000	42.6	A	V	1.0	0	X	LOW	29.7	3.8	32.7	0.0	0.0	43.5	-17.3	60.8	
2169.6000	43.1	A	V	1.0	0	Y	LOW	29.7	3.8	32.7	0.0	0.0	44.0	-16.8	60.8	
2169.6000	42.5	A	V	1.0	180	Z	LOW	29.7	3.8	32.7	0.0	0.0	43.4	-17.4	60.8	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.231)

COMPANY	NAPCO SECURITY GROUP	DATE	5/29/03
EUT	2-WAY UNIVERSAL LCD KEYFOB	DUTY CYCLE	51.675 %
MODEL	2WAY-UNIVKF	PEAK TO AVG	-5.73439029 dB
S/N	N/A	TEST DIST.	3 Meters
TEST ENGINEER	Kyle Fujimoto	LAB	D

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)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2603.5200	41.6	A	H	1.5	180	X	LOW	30.6	3.6	31.2	0.0	0.0	44.6	-16.2	60.8	
2603.5200	43.7	A	H	1.0	0	Y	LOW	30.6	3.6	31.2	0.0	0.0	46.7	-14.1	60.8	
2603.5200	43.4	A	H	1.0	180	Z	LOW	30.6	3.6	31.2	0.0	0.0	46.4	-14.4	60.8	
2603.5200	42.8	A	V	1.0	0	X	LOW	30.6	3.6	31.2	0.0	0.0	45.8	-15.0	60.8	
2603.5200	45.0	A	V	1.0	180	Y	LOW	30.6	3.6	31.2	0.0	0.0	48.0	-12.8	60.8	
2603.5200	43.0	A	V	1.0	270	Z	LOW	30.6	3.6	31.2	0.0	0.0	46.0	-14.8	60.8	

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

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.231)

COMPANY	NAPCO SECURITY GROUP	DATE	5/29/03
EUT	2-WAY UNIVERSAL LCD KEYFOB	DUTY CYCLE	51.675 %
MODEL	2WAY-UNIVKF	PEAK TO AVG	-5.73439029 dB
S/N	N/A	TEST DIST.	3 Meters
TEST ENGINEER	Kyle Fujimoto	LAB	D

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)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3037.4400	37.4	A	H	1.0	270	X	LOW	31.3	4.3	31.3	0.0	0.0	41.7	-19.1	60.8	
3037.4400		A	H			Y	LOW	31.3	4.3	31.3	0.0				60.8	No Emission Found
3037.4400		A	H			Z	LOW	31.3	4.3	31.3	0.0				60.8	No Emission Found
3037.4400	40.7	A	V	1.0	180	X	LOW	31.3	4.3	31.3	0.0	0.0	45.0	-15.8	60.8	
3037.4400		A	V			Y	LOW	31.3	4.3	31.3	0.0				60.8	No Emission Found
3037.4400		A	V			Z	LOW	31.3	4.3	31.3	0.0				60.8	No Emission Found
																No Emissions Found
																After the 7th Harmonic

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

Page: 1 of 1

Test location : Compatible Electronics
Customer : NAPCO Security Group Date: 5/29/2003
Manufacturer : NAPCO Security Group Time: 13.48
EUT name : 2-Way Universal LCD Keyfob
Model: 2WAY-UNIVKF
Specification : Fcc_B Test distance: 3.0 mtrs Lab: D
Distance correction factor($20 \cdot \log(\text{test}/\text{spec})$) : 0.00
Test Mode : Spurious Emissions 10 kHz to 4400 MHz
Horizontal and Vertical Polarizations
Tested By: Kyle Fujimoto

No Spurious Emissions Found in Either Polarization
For the EUT



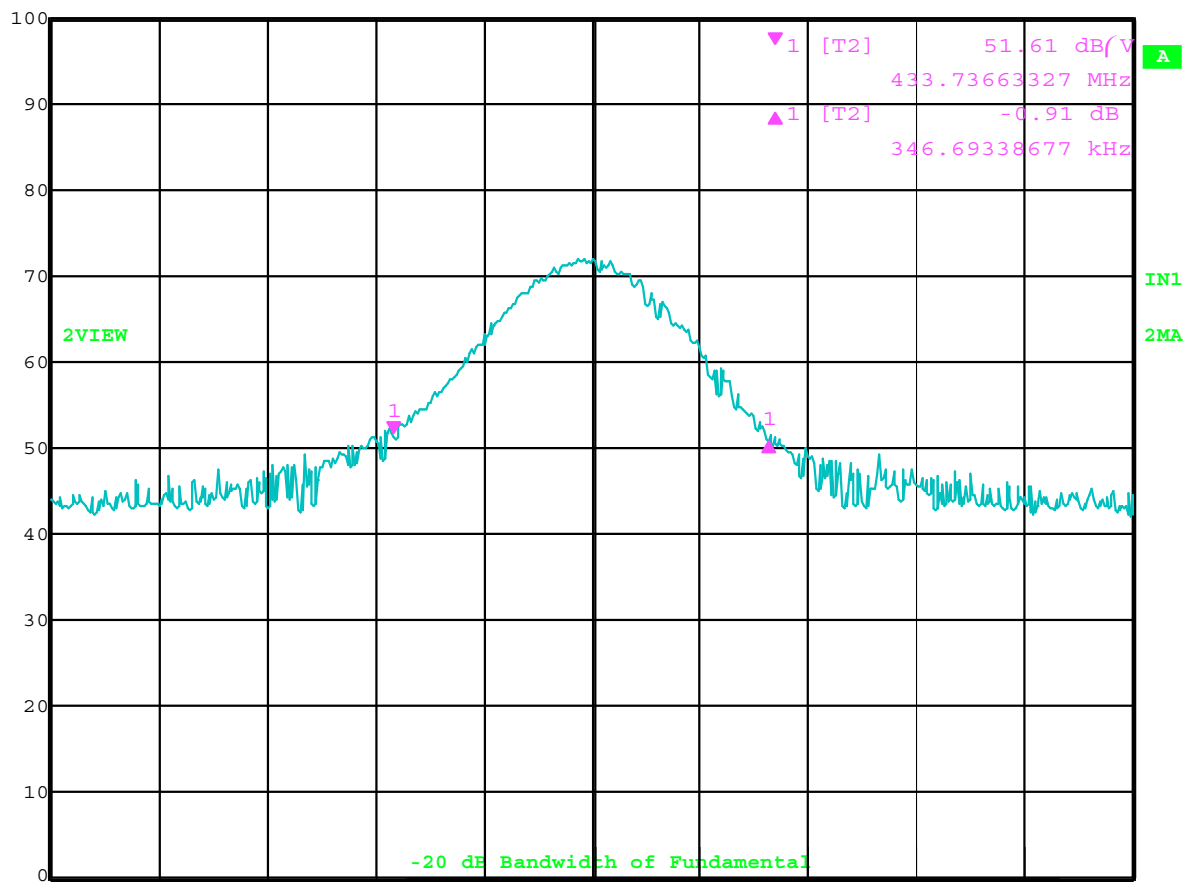
-20 dB BANDWIDTH

DATA SHEET





Delta 1 [T2] RBW 100 kHz RF Att 30 dB
Ref Lvl -0.91 dB VBW 100 kHz
100 dB/V 346.69338677 kHz SWT 20 ms Unit dB/V



Center 433.92 MHz 100 kHz/ Span 1 MHz

Date: 15.OCT.2003 22:59:24