

*FCC PART 15, SUBPART B and C
TEST REPORT**for***WIRELESS INTERCOM****MODEL: AD-27AW**

Prepared for

**FEDERAL SIGNAL CORPORATION
2645 FEDERAL SIGNAL DRIVE
UNIVERSITY PARK, ILLINOIS 60466-3195**

Prepared by: _____

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DATE: MARCH 09, 2004

	REPORT BODY	APPENDICES					TOTAL
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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: Wireless Intercom
Model: AD-27AW
S/N: N/A

Product Description: See Expository Statement

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

Manufacturer: Federal Signal Corporation
2645 Federal Signal Drive
University Park, Illinois 60466-3195

Test Dates: March 5 and 8, 2004

Test Specifications: EMI requirements
CFR Title 47, Part 15 Subpart B; and Subpart C, Sections 15.205, 15.207, 15.209 and 15.249

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	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and Subpart C, section 15.207.
2	Radiated RF Emissions, 10 kHz - 9300 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.249.

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Wireless Intercom Model: AD-27AW. 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, 15.207, 15.209, and 15.249.



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

Federal Signal Corporation

Pat Morasan	Engineer
Stephen Niemczak	Director of Engineering

Compatible Electronics, Inc.

Benigno Chavez	Test Technician
Kyle Fujimoto	Test Engineer
Michael Christensen	Sr. Test Engineer

2.4 Date Test Sample was Received

The test sample was received on March 5, 2004.

2.5 Disposition of the Test Sample

The sample has not yet been returned to Federal Signal Corporation as of March 9, 2004.

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 Wireless Intercom Model: AD-27AW (EUT) was connected to the AC public mains via its power cord. The EUT was tested while it was continuously transmitting and receiving. The antenna is hard wired to the PCB inside the EUT.

The final radiated as well as the conducted data were taken in the mode above. Please see Appendix E for the data sheets.

4.1.1 Cable Construction and Termination

The EUT has no external cables besides the power cord.



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

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
WIRELESS INTERCOM (EUT)	FEDERAL SIGNAL CORPORATION	AD-27AW	N/A	HVVAD27W1

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Radiate Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Emissions Program	Compatible Electronics	2.3 (SR19)	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08768	June 25, 2003	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	3701A22262	June 25, 2003	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	June 24, 2003	1 Year
EMI Receiver	Rhode & Schwarz	ESIB40	100172	July 22, 2003	1 Year
Preamplifier	Com-Power	PA-102	1017	January 6, 2004	1 Year
Biconical Antenna	Com Power	AB-100	1548	October 8, 2003	1 Year
Log Periodic Antenna	Com Power	AL-100	16089	October 8, 2003	1 Year
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	25310	June 4, 2003	1 Year
Horn Antenna	Antenna Research	DRG-118/A	1053	January 16, 2004	1 Year
Microwave Preamplifier	Com-Power	PA-122	25195	August 19, 2003	1 Year
LISN	Com Power	LI-215	12078	November 22,2003	1 Year
LISN	Com Power	LI-215	12082	November 22,2003	1 Year
RF Attenuator	Weinschel Corporation	2	BJ6396	August 7, 2003	1 Year

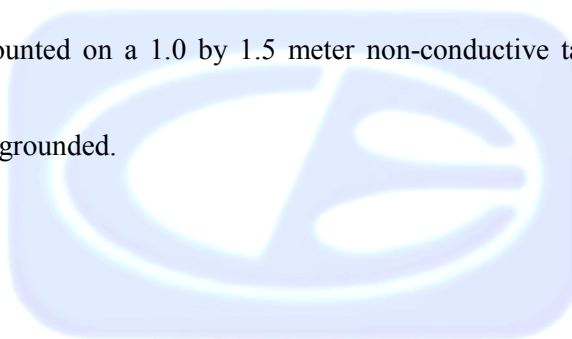
6. TEST SITE DESCRIPTION**6.1 Test Facility Description**

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 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. 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 offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this 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: 2001. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and Subpart C, section 15.207 for conducted emissions.

7.2 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 from 1 GHz to 18 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 9.3 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.

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.

8. CONCLUSIONS

The Wireless Intercom Model: AD-27AW 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 15.249.



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

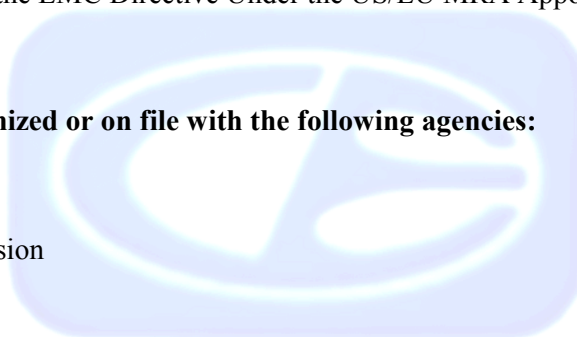
Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

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 15.249 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 during testing.





APPENDIX C

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

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

Wireless Intercom
Model: AD-27AW
S/N: N/A

ADDITIONAL MODELS COVERED UNDER THIS REPORT

Wireless Intercom
Model: AD-27W
S/N: N/A

The AD-27W is similar to the AD-27AW, except the AD-27W does not have the call feature.



APPENDIX D***DIAGRAMS, CHARTS, AND PHOTOS***

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

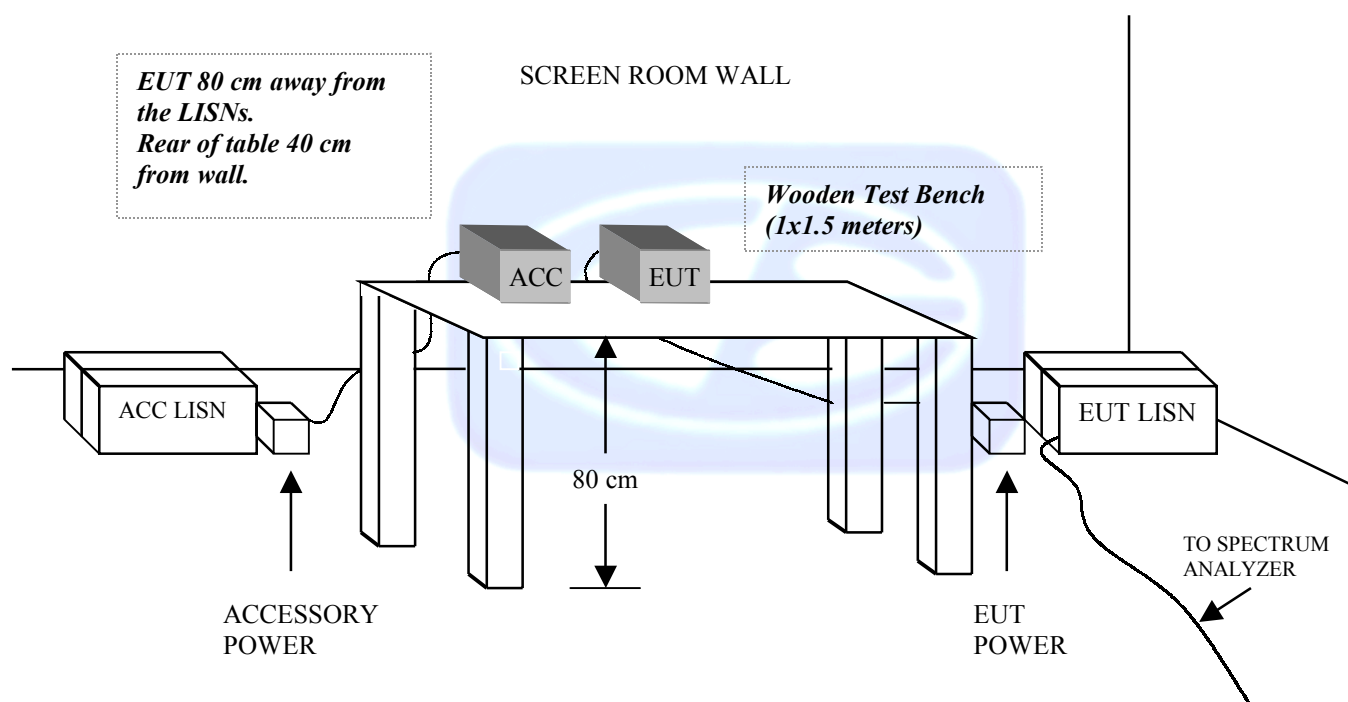
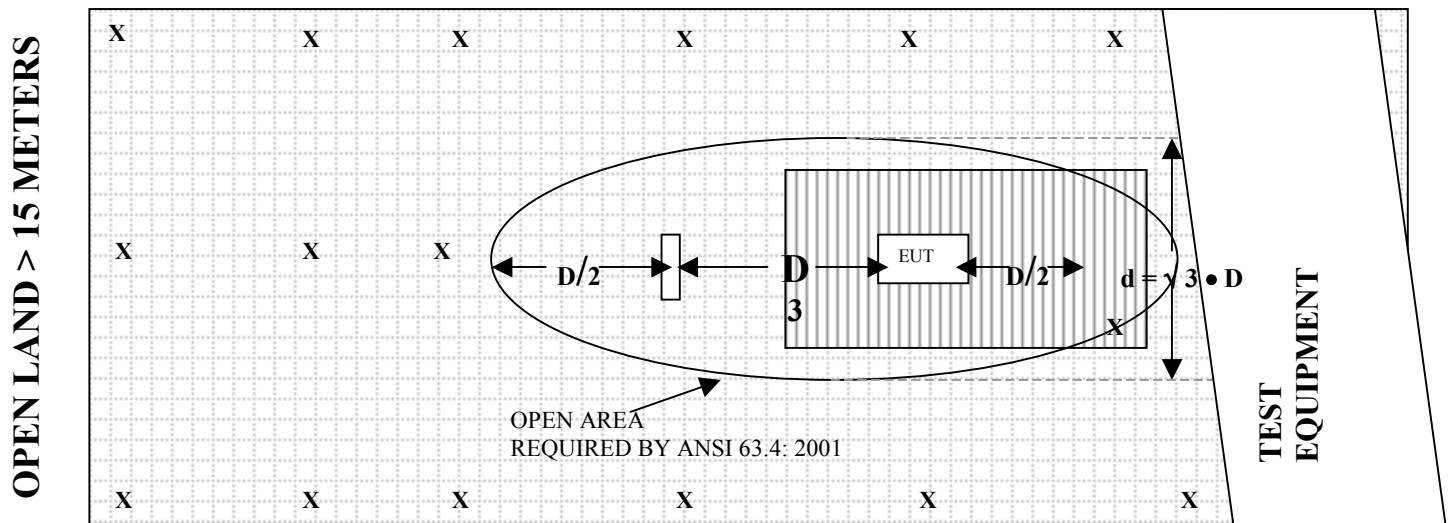


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

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: 1548

CALIBRATION DATE: OCTOBER 8, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	13.1	120	9.9
35	12.9	125	11.4
40	14.6	140	12.0
45	12.8	150	13.0
50	12.9	160	13.9
60	9.3	175	14.2
70	8.2	180	14.3
80	8.0	200	14.9
90	8.1	250	16.6
100	8.8	300	19.7

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16089

CALIBRATION DATE: OCTOBER 8, 2003

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	12.8	700	20.0
400	14.4	800	21.2
500	16.0	900	20.8
600	17.7	1000	21.7

COM-POWER PA-102**PREAMPLIFIER**

S/N: 1017

CALIBRATION DATE: JANUARY 6, 2004

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	37.8	300	37.6
40	37.5	350	37.5
50	37.7	400	37.5
60	37.5	450	37.0
70	37.5	500	37.1
80	37.5	550	37.3
90	37.5	600	37.1
100	37.5	650	37.4
125	37.8	700	37.1
150	37.5	750	37.1
175	37.5	800	36.8
200	37.6	850	36.2
225	37.6	900	36.7
250	37.5	950	36.2
275	37.6	1000	35.3

COM-POWER PA-122

MICROWAVE PREAMPLIFIER

S/N: 25195

CALIBRATION DATE: AUGUST 19, 2003

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	30.8	6.0	33.3
1.1	30.9	6.5	32.7
1.2	30.9	7.0	31.8
1.3	30.4	7.5	31.6
1.4	30.7	8.0	30.3
1.5	31.0	8.5	29.0
1.6	31.2	9.0	29.0
1.7	30.3	9.5	29.5
1.8	28.9	10.0	30.9
1.9	31.2	11.0	30.2
2.0	30.9	12.0	28.7
2.5	30.4	13.0	30.3
3.0	31.7	14.0	28.7
3.5	32.6	15.0	29.5
4.0	32.6	16.0	31.1
4.5	32.2	17.0	30.1
5.0	31.1	18.0	28.6
5.5	30.6		

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

S/N: 1053

CALIBRATION DATE: JANUARY 16, 2004

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.4	10.0	38.7
1.5	25.2	10.5	39.0
2.0	28.2	11.0	38.9
2.5	28.5	11.5	41.3
3.0	30.1	12.0	40.5
3.5	31.0	12.5	40.0
4.0	31.2	13.0	40.2
4.5	31.9	13.5	40.5
5.0	33.2	14.0	41.6
5.5	33.7	14.5	44.8
6.0	34.3	15.0	41.4
6.5	35.0	15.5	39.2
7.0	36.7	16.0	39.4
7.5	37.3	16.5	40.9
8.0	37.1	17.0	42.6
8.5	37.3	17.5	45.1
9.0	37.7	18.0	41.7
9.5	38.6		

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

S/N: 25310

CALIBRATION DATE: JUNE 4, 2003

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.2	10.3
0.01	-41.3	10.2
0.02	-42.3	9.2
0.05	-42.5	9.0
0.07	-42.3	9.2
0.1	-42.5	9.0
0.2	-44.6	6.9
0.3	-42.1	9.4
0.5	-42.4	9.1
0.7	-42.1	9.4
1	-41.5	10.0
2	-41.0	10.5
3	-41.3	10.2
4	-41.3	10.2
5	-40.9	10.6
10	-41.6	9.9
15	-42.1	9.4
20	-42.2	9.3
25	-42.7	8.8
30	-44.3	7.2



FRONT VIEW

FEDERAL SIGNAL CORPORATION
WIRELESS INTERCOM
MODEL: AD-27AW

FCC SUBPART B AND FCC SUBPART C - RADIATED EMISSIONS – 03-05-04

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

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400



REAR VIEW

FEDERAL SIGNAL CORPORATION
WIRELESS INTERCOM
MODEL: AD-27AW

FCC SUBPART B AND FCC SUBPART C - RADIATED EMISSIONS – 03-05-04

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(949) 589-0700

Lake Forest Division
20621 Pascal Way
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FRONT VIEW

FEDERAL SIGNAL CORPORATION
WIRELESS INTERCOM
MODEL: AD-27AW

FCC SUBPART B AND FCC SUBPART C - RADIATED EMISSIONS – 03-08-04

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Brea Division
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REAR VIEW

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WIRELESS INTERCOM
MODEL: AD-27AW

FCC SUBPART B AND FCC SUBPART C - RADIATED EMISSIONS – 03-08-04

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Brea Division
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FRONT VIEW

FEDERAL SIGNAL CORPORATION
WIRELESS INTERCOM
MODEL: AD-27AW

FCC SUBPART B AND FCC SUBPART C - CONDUCTED EMISSIONS – 03-08-04

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

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REAR VIEW

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WIRELESS INTERCOM
MODEL: AD-27AW

FCC SUBPART B AND FCC SUBPART C - CONDUCTED EMISSIONS – 03-08-04

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
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(949) 587-0400

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS***DATA SHEETS***

RADIATED EMISSIONS (FCC SECTION 15.205 AND 15.249)

COMPANY	Federal Signal	DATE	3/5/04
EUT	Wireless Intercom	DUTY CYCLE	N/A %
MODEL	AD-27AW	PEAK TO AVG	N/A dB
S/N	N/A	TEST DIST.	3 Meters
TEST ENGINEER	Ben Chavez	LAB	D

Frequency MHz	Peak Reading (dBuV)	QP Reading (dBuV)	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
903.3000	63.7	63.7	V	1.0	135	X		20.8	3.1	0.0	0.0	0.0	87.6	-6.4	94.0	
903.3000	57.2	57.2	H	1.5	180	X		20.8	3.1	0.0	0.0	0.0	81.1	-12.9	94.0	
912.3000	64.1	64.1	V	1.0	135	X		20.9	3.1	0.0	0.0	0.0	88.1	-5.9	94.0	
912.3000	57.4	57.2	H	1.5	180	X		20.9	3.1	0.0	0.0	0.0	81.2	-12.8	94.0	
921.3000	63.7	63.7	V	1.0	135	X		21.0	3.1	0.0	0.0	0.0	87.8	-6.2	94.0	
921.3000	55.0	54.9	H	1.5	180	X		21.0	3.1	0.0	0.0	0.0	79.0	-15.0	94.0	
868.7000	53.5	53.1	V	1.0	135	X		20.9	3.0	36.4	0.0	0.0	40.6	-5.4	46.0	Receive Mode
868.7000	49.9	49.2	H	1.3	180	X		20.9	3.0	36.4	0.0	0.0	36.7	-9.3	46.0	Receive Mode
877.8000	53.5	52.6	V	1.0	135	X		20.9	3.0	36.5	0.0	0.0	40.0	-6.0	46.0	Receive Mode
877.8000	46.9	45.1	H	1.3	180	X		20.9	3.0	36.5	0.0	0.0	32.5	-13.5	46.0	Receive Mode
886.8000	55.6	54.9	V	1.3	225	X		20.9	3.0	36.6	0.0	0.0	42.2	-3.8	46.0	Receive Mode
886.8000	59.2	56.0	H	1.3	180	X		20.9	3.0	36.6	0.0	0.0	43.3	-2.7	46.0	Receive Mode

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

** DELTA = SPEC LIMIT - CORRECTED READING

PAGE 1 of PAGE 1

FCC 15.249

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Tx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

Low Channel**Transmit Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1806.6	53.28	V	74	-20.72	Peak	1.5	180	
1806.6	51.18	V	54	-2.82	Avg	1.5	180	
2709.9	46.67	V	74	-27.33	Peak	1.5	225	
2709.9	37.51	V	54	-16.49	Avg	1.5	225	
3613.2	49.52	V	74	-24.48	Peak	1.25	225	
3613.2	37.93	V	54	-16.07	Avg	1.25	225	
4516.5	50.06	V	74	-23.94	Peak	1.25	0	
4516.5	37.02	V	54	-16.98	Avg	1.25	0	
5419.8		V	74	-74	Peak			No Emissions
5419.8		V	54	-54	Avg			Detected
6323.1		V	74	-74	Peak			No Emissions
6323.1		V	54	-54	Avg			Detected
7226.4		V	74	-74	Peak			No Emissions
7226.4		V	54	-54	Avg			Detected
8129.7		V	74	-74	Peak			No Emissions
8129.7		V	54	-54	Avg			Detected
9033.0		V	74	-74	Peak			No Emissions
9033.0		V	54	-54	Avg			Detected

FCC 15.249

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Tx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

**Low Channel
Transmit Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1806.6	48.42	H	74	-25.58	Peak	1.5	135	
1806.6	43.78	H	54	-10.22	Avg	1.5	135	
2709.9	47.01	H	74	-26.99	Peak	1.75	225	
2709.9	40.41	H	54	-13.59	Avg	1.75	225	
3613.2	50.21	H	74	-23.79	Peak	1.75	180	
3613.2	38.94	H	54	-15.06	Avg	1.75	180	
4516.5	50.67	H	74	-23.33	Peak	2	180	
4516.5	38.13	H	54	-15.87	Avg	2	180	
5419.8		H	74	-74	Peak			No Emissions
5419.8		H	54	-54	Avg			Detected
6323.1		H	74	-74	Peak			No Emissions
6323.1		H	54	-54	Avg			Detected
7226.4		H	74	-74	Peak			No Emissions
7226.4		H	54	-54	Avg			Detected
8129.7		H	74	-74	Peak			No Emissions
8129.7		H	54	-54	Avg			Detected
9033.0		H	74	-74	Peak			No Emissions
9033.0		H	54	-54	Avg			Detected

FCC 15.249

Federal Signal
Wireless Intercom
M/N: AD-27AW
Configuration: Tx mode

Date: 3/05/04
Lab: B
Tested By: Ben Chavez

Middle Channel
Transmit Mode

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1824.6	54.65	V	74	-19.35	Peak	1.5	180	
1824.6	52.6	V	54	-1.4	Avg	1.5	180	
2736.9	48.03	V	74	-25.97	Peak	1.5	225	
2736.9	40.17	V	54	-13.83	Avg	1.5	225	
3649.2	49.19	V	74	-24.81	Peak	1.75	225	
3649.2	37.47	V	54	-16.53	Avg	1.75	225	
4561.5	49.82	V	74	-24.18	Peak	1.5	225	
4561.5	36.64	V	54	-17.36	Avg	1.5	225	
5473.8		V	74	-74	Peak			No Emissions
5473.8		V	54	-54	Avg			Detected
6386.1		V	74	-74	Peak			No Emissions
6386.1		V	54	-54	Avg			Detected
7298.4		V	74	-74	Peak			No Emissions
7298.4		V	54	-54	Avg			Detected
8210.7		V	74	-74	Peak			No Emissions
8210.7		V	54	-54	Avg			Detected
9123.0		V	74	-74	Peak			No Emissions
9123.0		V	54	-54	Avg			Detected

FCC 15.249Federal Signal
Wireless Intercom

M/N: AD-27

Configuration: Tx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

Middle Channel**Transmit Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1824.6	47.03	H	74	-26.97	Peak	2	270	
1824.6	41.22	H	54	-12.78	Avg	2	270	
2736.9	42.77	H	74	-31.23	Peak	1.75	225	
2736.9	38.62	H	54	-15.38	Avg	1.75	225	
3649.2	49.61	H	74	-24.39	Peak	1.75	225	
3649.2	38.67	H	54	-15.33	Avg	1.75	225	
4561.5	50.56	H	74	-23.44	Peak	1.75	180	
4561.5	37.07	H	54	-16.93	Avg	1.75	180	
5473.8		H	74	-74	Peak			No Emissions
5473.8		H	54	-54	Avg			Detected
6386.1		H	74	-74	Peak			No Emissions
6386.1		H	54	-54	Avg			Detected
7298.4		H	74	-74	Peak			No Emissions
7298.4		H	54	-54	Avg			Detected
8210.7		H	74	-74	Peak			No Emissions
8210.7		H	54	-54	Avg			Detected
9123.0		H	74	-74	Peak			No Emissions
9123.0		H	54	-54	Avg			Detected

FCC 15.249

Federal Signal
Wireless Intercom
M/N: AD-27AW
Configuration: Tx mode

Date: 3/05/04
Lab: B
Tested By: Ben Chavez

**High Channel
Transmit Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1842.6	48.65	V	74	-25.35	Peak	1.75	270	
1842.6	43.96	V	54	-10.04	Avg	1.75	270	
2763.9	48.8	V	74	-25.2	Peak	1.75	315	
2763.9	41.87	V	54	-12.13	Avg	1.75	315	
3685.2	48.91	V	74	-25.09	Peak	1.75	315	
3685.2	36.84	V	54	-17.16	Avg	1.75	315	
4606.5	50.13	V	74	-23.87	Peak	1.5	225	
4606.5	36.95	V	54	-17.05	Avg	1.5	225	
5527.8		V	74	-74	Peak			No Emissions
5527.8		V	54	-54	Avg			Detected
6449.1		V	74	-74	Peak			No Emissions
6449.1		V	54	-54	Avg			Detected
7370.4		V	74	-74	Peak			No Emissions
7370.4		V	54	-54	Avg			Detected
8291.7		V	74	-74	Peak			No Emissions
8291.7		V	54	-54	Avg			Detected
9213.0		V	74	-74	Peak			No Emissions
9213.0		V	54	-54	Avg			Detected

FCC 15.249

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Tx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

High Channel**Transmit Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1842.6	48.67	H	74	-25.33	Peak	1.5	135	
1842.6	44.07	H	54	-9.93	Avg	1.5	135	
2763.9	47.55	H	74	-26.45	Peak	1.5	135	
2763.9	37.92	H	54	-16.08	Avg	1.5	135	
3685.2	47.78	H	74	-26.22	Peak	1.5	225	
3685.2	34.56	H	54	-19.44	Avg	1.5	225	
4606.5	50.01	H	74	-23.99	Peak	1.75	315	
4606.5	37.09	H	54	-16.91	Avg	1.75	315	
5527.8		H	74	-74	Peak			No Emissions
5527.8		H	54	-54	Avg			Detected
6449.1		H	74	-74	Peak			No Emissions
6449.1		H	54	-54	Avg			Detected
7370.4		H	74	-74	Peak			No Emissions
7370.4		H	54	-54	Avg			Detected
8291.7		H	74	-74	Peak			No Emissions
8291.7		H	54	-54	Avg			Detected
9213.0		H	74	-74	Peak			No Emissions
9213.0		H	54	-54	Avg			Detected

FCC Class B and FCC 15.249

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Tx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

Digital Portion and Non Harmonic Emissions - 1 GHz to 9.3 GHz

Transmit Mode

[illegible]

FCC Class B

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Rx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

Low Channel**Receive Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1737.4	43.72	V	74	-30.28	Peak	1.75	180	
1737.4	32.4	V	54	-21.6	Avg	1.75	180	
2606.1		V	74	-74	Peak			No Emissions
2606.1		V	54	-54	Avg			Detected
3474.8		V	74	-74	Peak			No Emissions
3474.8		V	54	-54	Avg			Detected
4343.5		V	74	-74	Peak			No Emissions
4343.5		V	54	-54	Avg			Detected
5212.2		V	74	-74	Peak			No Emissions
5212.2		V	54	-54	Avg			Detected
6080.9		V	74	-74	Peak			No Emissions
6080.9		V	54	-54	Avg			Detected
6949.6		V	74	-74	Peak			No Emissions
6949.6		V	54	-54	Avg			Detected
7818.3		V	74	-74	Peak			No Emissions
7818.3		V	54	-54	Avg			Detected
8687		V	74	-74	Peak			No Emissions
8687		V	54	-54	Avg			Detected

FCC Class B

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Rx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

Low Channel**Receive Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1737.4	44.58	H	74	-29.42	Peak	1.75	180	
1737.4	35.54	H	54	-18.46	Avg	1.75	180	
2606.1		H	74	-74	Peak			No Emissions
2606.1		H	54	-54	Avg			Detected
3474.8		H	74	-74	Peak			No Emissions
3474.8		H	54	-54	Avg			Detected
4343.5		H	74	-74	Peak			No Emissions
4343.5		H	54	-54	Avg			Detected
5212.2		H	74	-74	Peak			No Emissions
5212.2		H	54	-54	Avg			Detected
6080.9		H	74	-74	Peak			No Emissions
6080.9		H	54	-54	Avg			Detected
6949.6		H	74	-74	Peak			No Emissions
6949.6		H	54	-54	Avg			Detected
7818.3		H	74	-74	Peak			No Emissions
7818.3		H	54	-54	Avg			Detected
8687		H	74	-74	Peak			No Emissions
8687		H	54	-54	Avg			Detected

FCC Class B

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Rx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

Middle Channel**Receive Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1755.6	43.12	V	74	-30.88	Peak	1.5	225	
1755.6	30.25	V	54	-23.75	Avg	1.5	225	
2633.4		V	74	-74	Peak			No Emissions
2633.4		V	54	-54	Avg			Detected
3511.2		V	74	-74	Peak			No Emissions
3511.2		V	54	-54	Avg			Detected
4389		V	74	-74	Peak			No Emissions
4389		V	54	-54	Avg			Detected
5266.8		V	74	-74	Peak			No Emissions
5266.8		V	54	-54	Avg			Detected
6144.6		V	74	-74	Peak			No Emissions
6144.6		V	54	-54	Avg			Detected
7022.4		V	74	-74	Peak			No Emissions
7022.4		V	54	-54	Avg			Detected
7900.2		V	74	-74	Peak			No Emissions
7900.2		V	54	-54	Avg			Detected
8778		V	74	-74	Peak			No Emissions
8778		V	54	-54	Avg			Detected

FCC Class B

Federal Signal
Wireless Intercom

M/N: AD-27AW

Configuration: Rx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

Middle Channel**Receive Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1755.6	43.71	H	74	-30.29	Peak	1.75	180	
1755.6	31.84	H	54	-22.16	Avg	1.75	180	
2633.4		H	74	-74	Peak			No Emissions
2633.4		H	54	-54	Avg			Detected
3511.2		H	74	-74	Peak			No Emissions
3511.2		H	54	-54	Avg			Detected
4389		H	74	-74	Peak			No Emissions
4389		H	54	-54	Avg			Detected
5266.8		H	74	-74	Peak			No Emissions
5266.8		H	54	-54	Avg			Detected
6144.6		H	74	-74	Peak			No Emissions
6144.6		H	54	-54	Avg			Detected
7022.4		H	74	-74	Peak			No Emissions
7022.4		H	54	-54	Avg			Detected
7900.2		H	74	-74	Peak			No Emissions
7900.2		H	54	-54	Avg			Detected
8778		H	74	-74	Peak			No Emissions
8778		H	54	-54	Avg			Detected

FCC Class B

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Rx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

High Channel**Receive Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1773.6	45.03	V	74	-28.97	Peak	1.75	180	
1773.6	35.26	V	54	-18.74	Avg	1.75	180	
2660.4		V	74	-74	Peak			No Emissions
2660.4		V	54	-54	Avg			Detected
3547.2		V	74	-74	Peak			No Emissions
3547.5		V	54	-54	Avg			Detected
4434		V	74	-74	Peak			No Emissions
4434		V	54	-54	Avg			Detected
5320.8		V	74	-74	Peak			No Emissions
5320.8		V	54	-54	Avg			Detected
6207.6		V	74	-74	Peak			No Emissions
6207.6		V	54	-54	Avg			Detected
7094.4		V	74	-74	Peak			No Emissions
7094.4		V	54	-54	Avg			Detected
7981.2		V	74	-74	Peak			No Emissions
7981.2		V	54	-54	Avg			Detected
8868		V	74	-74	Peak			No Emissions
8868		V	54	-54	Avg			Detected

FCC Class B

Federal Signal

Wireless Intercom

M/N: AD-27AW

Configuration: Rx mode

Date: 3/05/04

Lab: B

Tested By: Ben Chavez

High Channel**Receive Mode**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1773.6	43.87	H	74	-30.13	Peak	2	180	
1773.6	31.88	H	54	-22.12	Avg	2	180	
2660.4		H	74	-74	Peak			No Emissions
2660.4		H	54	-54	Avg			Detected
3547.2		H	74	-74	Peak			No Emissions
3547.5		H	54	-54	Avg			Detected
4434		H	74	-74	Peak			No Emissions
4434		H	54	-54	Avg			Detected
5320.8		H	74	-74	Peak			No Emissions
5320.8		H	54	-54	Avg			Detected
6207.6		H	74	-74	Peak			No Emissions
6207.6		H	54	-54	Avg			Detected
7094.4		H	74	-74	Peak			No Emissions
7094.4		H	54	-54	Avg			Detected
7981.2		H	74	-74	Peak			No Emissions
7981.2		H	54	-54	Avg			Detected
8868		H	74	-74	Peak			No Emissions
8868		H	54	-54	Avg			Detected

Federal Signal
Wireless Intercom
M/N: AD-27AW
Configuration: Rx mode

Date: 3/05/04
Lab: B
Tested By: Ben Chavez

[illegible]



Test Location	: Compatible Electronics	Page	: 1/1
Customer	: Federal Signal	Date	: 3/08/2004
Manufacturer	: Federal Signal	Time	: 8:06:21
Eut name	: Wireless Intercom	Lab	: D
Model	: AD-27AW	Test Distance	: 3.0 Meters
Serial #	: N/A		
Specification	: FCC Class B		
Distance correction factor (20 * log(test/spec))			: 0.00
Test Mode	: Spurious Emissions - 10 kHz to 1 GHz Vertical and Horizontal Polarization - Transmit mode worst case Temperature 80 Degrees F., Relative Humidity 55% Tested By: Kyle Fujimoto		

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	Limit = L dBuV/m	Delta R-L dB
1V	30.000	51.00	0.50	13.10	37.80	26.80	40.00	-13.20
2V	48.000	45.50	0.52	12.86	37.66	21.22	40.00	-18.78
3V	76.000	42.30	0.86	8.08	37.50	13.74	40.00	-26.26
4V	275.000	36.80	1.60	18.22	37.60	19.02	46.00	-26.98
5V	432.122	42.00	2.10	14.95	37.17	21.88	46.00	-24.12
6V	609.650	35.00	2.50	17.94	37.16	18.28	46.00	-27.72
7H	30.000	43.50	0.50	13.10	37.80	19.30	40.00	-20.70
8H	238.200	34.90	1.55	16.23	37.55	15.14	46.00	-30.86
9H	258.840	34.70	1.60	17.19	37.54	15.95	46.00	-30.05
10H	503.019	34.40	2.30	16.06	37.11	15.64	46.00	-30.36
11H	613.785	35.70	2.50	18.04	37.19	19.05	46.00	-26.95
12H	659.857	37.50	2.58	19.12	37.34	21.86	46.00	-24.14

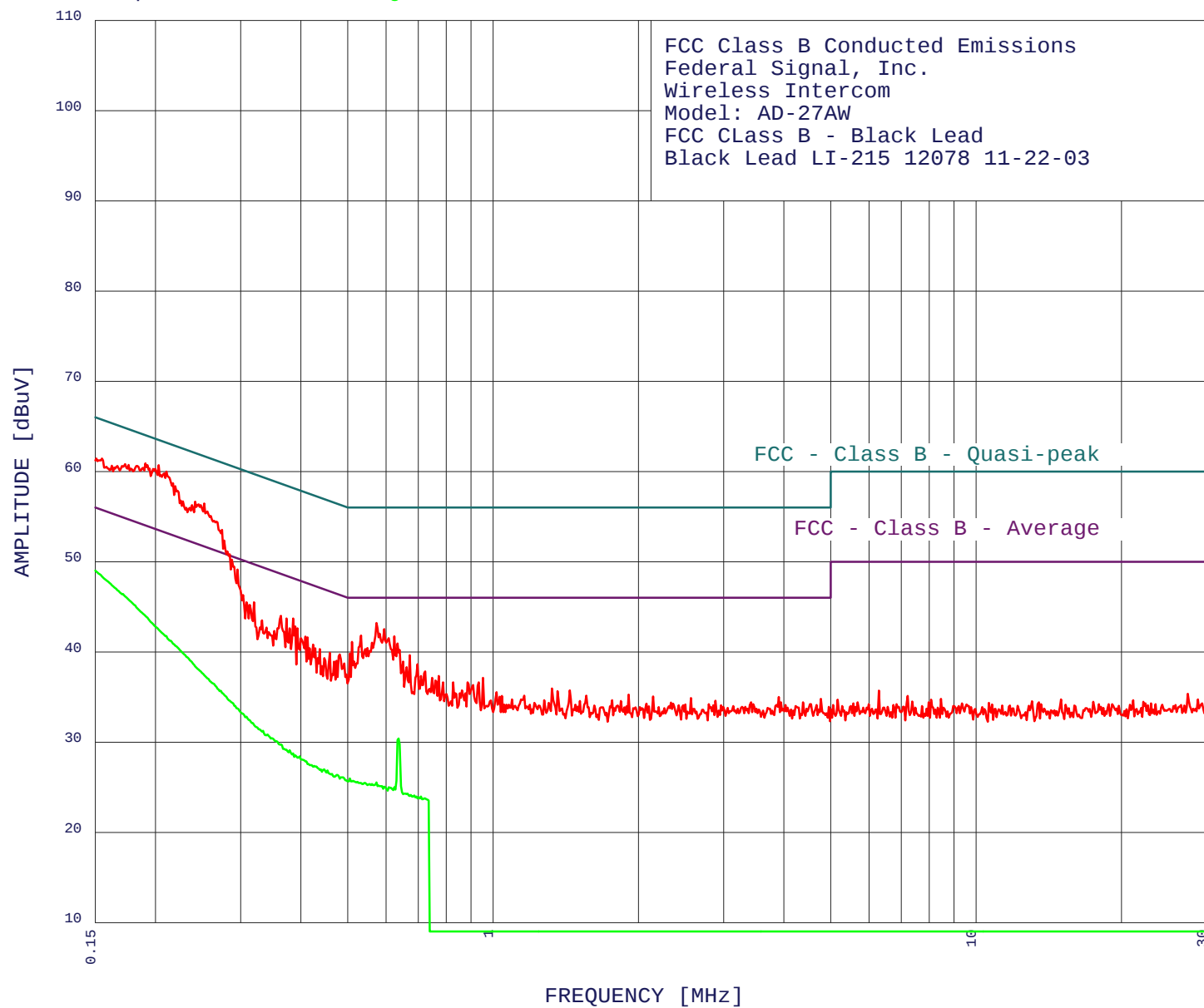
CONDUCTED EMISSIONS

DATA SHEETS

EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average

3/08/2004

9:24:42





3/08/2004

9:24:42

FCC Conducted Emissions

Federal Signal, Inc.

Wireless Intercom

Model: AD-27AW

FCC Class B - Black Lead

Black Lead LI-215 12078 11-22-03

TEST ENGINEER : Kyle Fujimoto

43 highest peaks above -50.00 dB of FCC - Class B - Average limit line

Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.203	60.69	53.49	7.20**
2	0.150	61.23	56.00	5.23
3	0.242	56.66	52.04	4.62**
4	0.288	50.22	50.58	-0.36**
5	0.296	49.12	50.36	-1.25**
6	0.573	43.21	46.00	-2.79**
7	0.595	42.52	46.00	-3.48**
8	0.532	41.81	46.00	-4.19**
9	0.320	45.51	49.71	-4.20**
10	0.624	41.72	46.00	-4.28**
11	0.385	43.71	48.16	-4.45**
12	0.309	45.51	50.01	-4.50**
13	0.363	44.01	48.65	-4.64**
14	0.313	45.21	49.88	-4.67**
15	0.373	43.71	48.43	-4.72**
16	0.510	41.11	46.00	-4.89**
17	0.634	40.92	46.00	-5.08**
18	0.389	42.81	48.08	-5.27**
19	0.393	42.61	47.99	-5.38**
20	0.379	42.61	48.29	-5.69**
21	0.332	43.51	49.39	-5.89**
22	0.409	41.71	47.68	-5.97**
23	0.413	41.61	47.59	-5.98**
24	0.505	39.81	46.00	-6.19**
25	0.400	41.51	47.86	-6.35**
26	0.672	39.62	46.00	-6.38**
27	0.424	40.81	47.37	-6.56**
28	0.481	39.71	46.32	-6.61**
29	0.438	40.31	47.11	-6.80**
30	0.459	39.91	46.71	-6.80**
31	0.428	40.41	47.28	-6.87**
32	0.651	38.92	46.00	-7.08**
33	0.417	40.41	47.50	-7.09**
34	0.698	38.62	46.00	-7.38**
35	0.474	39.01	46.45	-7.44**
36	0.447	39.31	46.93	-7.62**
37	0.469	38.91	46.53	-7.62**
38	0.662	38.32	46.00	-7.68**
39	0.724	37.82	46.00	-8.18**
40	0.771	37.32	46.00	-8.68
41	0.953	37.13	46.00	-8.87
42	0.747	37.12	46.00	-8.88
43	0.759	36.82	46.00	-9.18


**COMPATIBLE
ELECTRONICS**

3/08/2004

9:24:42

FCC Conducted Emissions

Federal Signal, Inc.

Wireless Intercom

Model: AD-27AW

FCC Class B - Black Lead

Black Lead LI-215 12078 11-22-03

TEST ENGINEER : Kyle Fujimoto

 21 highest peaks above -50.00 dB of FCC - Class B - Average limit line

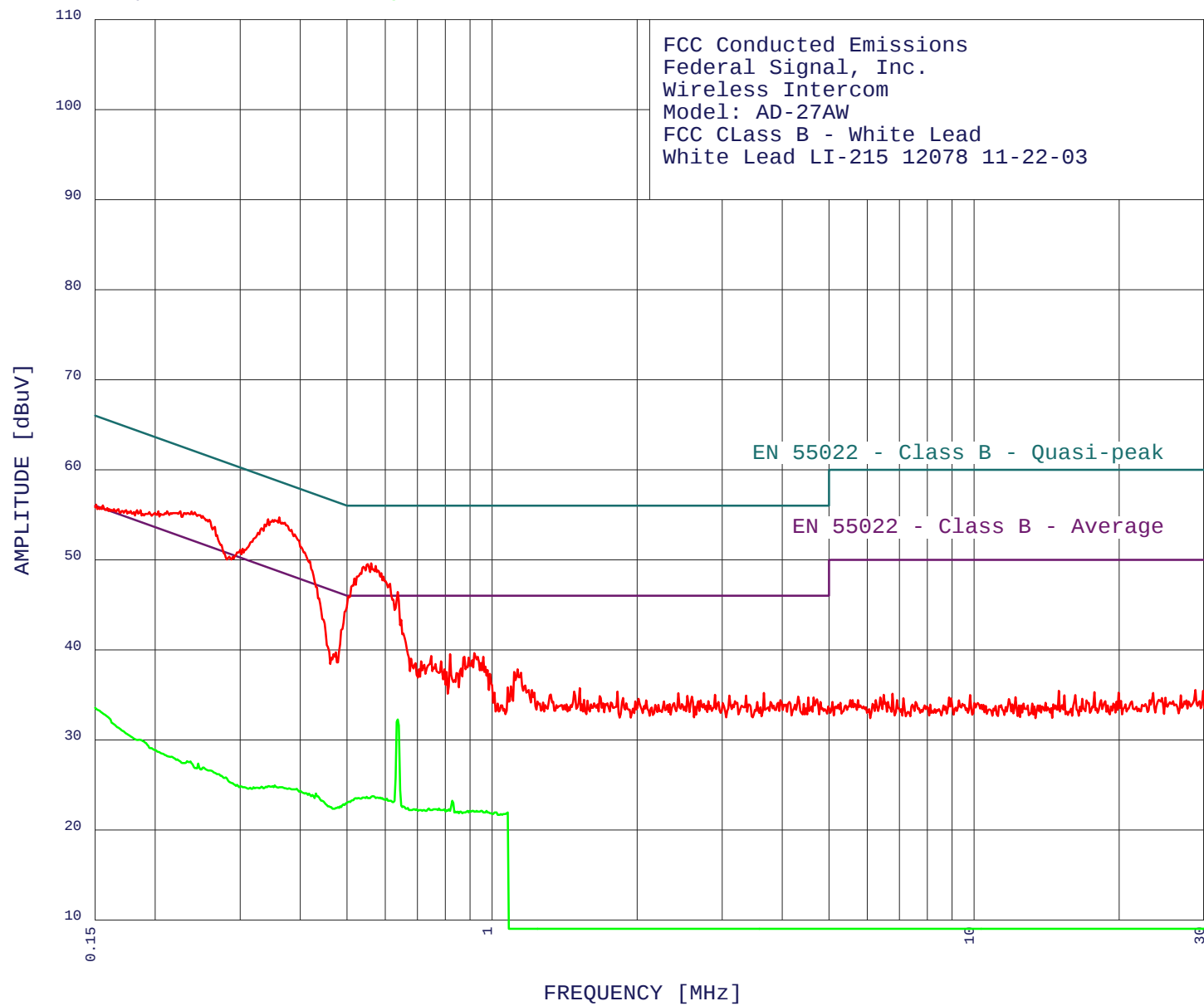
Peak criteria : 0.10 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.637	30.39	46.00	-15.61
2	0.379	29.09	48.29	-19.21
3	0.385	28.74	48.16	-19.42
4	0.398	28.41	47.90	-19.49
5	0.389	28.54	48.08	-19.54
6	0.454	26.87	46.80	-19.93
7	0.447	26.97	46.93	-19.96
8	0.505	25.98	46.00	-20.02
9	0.476	26.36	46.40	-20.04
10	0.489	26.09	46.18	-20.09
11	0.573	25.53	46.00	-20.47
12	0.544	25.47	46.00	-20.53
13	0.561	25.36	46.00	-20.64
14	0.555	25.36	46.00	-20.64
15	0.595	25.07	46.00	-20.93
16	0.624	25.00	46.00	-21.00
17	0.608	25.00	46.00	-21.00
18	0.676	24.16	46.00	-21.84
19	0.686	24.09	46.00	-21.91
20	0.709	23.96	46.00	-22.04
21	0.701	23.89	46.00	-22.11

EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average

3/08/2004

9:40:39





3/08/2004

9:40:39

FCC Conducted Emissions

Federal Signal, Inc.

Wireless Intercom

Model: AD-27AW

FCC Class B - White Lead

White Lead LI-215 12078 11-22-03

TEST ENGINEER : Kyle Fujimoto

42 highest peaks above -50.00 dB of FCC - Class B - Average limit line

Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.362	54.71	48.69	6.02**
2	0.561	49.61	46.00	3.61**
3	0.637	46.42	46.00	0.42**
4	0.919	39.63	46.00	-6.37**
5	0.818	39.52	46.00	-6.48**
6	0.747	39.32	46.00	-6.68**
7	0.474	39.71	46.45	-6.74**
8	0.958	39.23	46.00	-6.77**
9	0.876	39.23	46.00	-6.77**
10	0.895	39.13	46.00	-6.87**
11	0.679	39.02	46.00	-6.98**
12	0.783	38.72	46.00	-7.28**
13	0.713	38.72	46.00	-7.28**
14	1.130	37.83	46.00	-8.17
15	0.796	37.82	46.00	-8.18**
16	0.805	37.52	46.00	-8.48**
17	0.844	37.42	46.00	-8.58**
18	0.990	37.33	46.00	-8.67**
19	1.094	35.93	46.00	-10.07
20	1.077	35.83	46.00	-10.17**
21	1.520	35.75	46.00	-10.25
22	1.210	35.54	46.00	-10.46
23	1.820	35.36	46.00	-10.64
24	1.480	35.35	46.00	-10.65
25	1.011	35.23	46.00	-10.77**
26	3.663	35.21	46.00	-10.79
27	2.436	35.18	46.00	-10.82
28	1.325	35.04	46.00	-10.96
29	2.900	35.00	46.00	-11.00
30	3.365	34.91	46.00	-11.09
31	3.107	34.90	46.00	-11.10
32	2.540	34.88	46.00	-11.12
33	1.671	34.85	46.00	-11.15
34	4.316	34.81	46.00	-11.19
35	2.596	34.79	46.00	-11.21
36	4.648	34.71	46.00	-11.29
37	4.528	34.71	46.00	-11.29
38	1.869	34.66	46.00	-11.34
39	2.013	34.56	46.00	-11.44
40	1.552	34.45	46.00	-11.55
41	3.966	34.41	46.00	-11.59
42	2.707	34.39	46.00	-11.61



3/08/2004

9:40:39

FCC Conducted Emissions

Federal Signal, Inc.

Wireless Intercom

Model: AD-27AW

FCC Class B - White Lead

White Lead LI-215 12078 11-22-03

TEST ENGINEER : Kyle Fujimoto

 27 highest peaks above -50.00 dB of FCC - Class B - Average limit line

Peak criteria : 0.10 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.637	32.26	46.00	-13.74
2	0.567	23.74	46.00	-22.26
3	0.550	23.67	46.00	-22.33
4	0.605	23.46	46.00	-22.54
5	0.826	23.23	46.00	-22.77
6	0.431	24.02	47.24	-23.22
7	0.417	24.02	47.50	-23.48
8	0.424	23.88	47.37	-23.49
9	0.400	24.36	47.86	-23.50
10	0.775	22.36	46.00	-23.64
11	0.739	22.36	46.00	-23.64
12	0.814	22.28	46.00	-23.72
13	0.974	22.11	46.00	-23.89
14	0.953	22.11	46.00	-23.89
15	0.890	22.11	46.00	-23.89
16	0.354	24.93	48.87	-23.94
17	0.862	22.02	46.00	-23.98
18	1.077	21.94	46.00	-24.06
19	1.021	21.94	46.00	-24.06
20	0.350	24.87	48.95	-24.09
21	0.246	27.36	51.90	-24.55
22	0.332	24.81	49.39	-24.59
23	0.233	27.64	52.34	-24.71
24	0.251	26.91	51.73	-24.81
25	0.320	24.74	49.71	-24.97
26	0.315	24.68	49.84	-25.16
27	0.296	25.00	50.36	-25.37
