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FCC PART 15.247 SPURIOUS EMISSIONS TEST REPORT

APPLICANT	Zhone Technologies
ADDRESS	Zhone Way 7001 Oakport St. Oakland, CA 94621 USA
PROPOSED FCC ID	PJZSZ1224
IC LABEL	IC: 3691A-SZ1224
MODEL NUMBER	SkyZhone-1224
PRODUCT DESCRIPTION	SkyZhone Wi-Fi Access Point
DATE SAMPLE RECEIVED	April 22, 2007
DATE TESTED	April 22, 2007
TESTED BY	Richard Block
APPROVED BY	Mario de Aranzeta C.E.T.
TIMCO REPORT NO	910AUT7TestReport.PDF
TEST RESULTS	☒ PASS ☐ FAIL

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Certificate # 0955-01

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ATTESTATION STATEMENT

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report and demonstrate that the equipment complies with the appropriate standards.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made by me or under my supervision, at Timco Engineering, Inc. located at 849 N.W. State Road 45, Newberry, Florida 32669 USA.



Certificate #0955-01

Authorized by: Mario de Aranzeta
Signature: On File
Function: Engineer
Date: May 9, 2007

REPORT SUMMARY

Disclaimer:	The test results relate only to the items tested.
Purpose of Test:	To show the DUT compliant with FCC Part 15.247 spurious emissions requirements for 2.4 GHz direct sequence radio.
Applicable Standard(s)/Procedure(s):	ANSI C63.4: 2003, ANSI/TIA – 603: 2004, Pt 15.247, Pt 15.209, Pt 15.204
Related Report/Approvals:	FCCID-ZHONE-04-18-07C.PDF

TEST ENVIRONMENT

Test Facilities:	Spurious emission measurement was made at Timco Engineering Inc. located at 849 N.W. State Road 45, Newberry, FL 32669.
Laboratory Test Conditions:	Temperature: 26°C, Humidity: 55%

TEST SETUP

Test Exercise (software, etc.):	The DUT was set in continuous transmit mode of operation.
Deviation to the Standards:	No deviation.
Modification to the DUT:	No modification
Supporting Equipment:	N/A. The DUT is a stand-alone device.

DUT DESCRIPTION

Product Description:	SkyZhone Wi-Fi Access Point
FCC ID:	PJZSZ1224
IC Label:	IC: 3691A-SZ1224
Model Number:	SkyZhone 1224
Brand Name:	SkyZhone
Operating Frequency:	2412 – 2462 MHz
Number of Channels:	11
Occupied Bandwidth:	See test report
Type of Modulation:	802.11b or 802.11g
EUT Power Source:	Telephone Line
Test Item:	Engineering Prototype
Type of Equipment:	Fixed
Antennas:	5 dBi monopoles
Antenna Connector:	Type N

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/27/07	3/26/010
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Biconnical Antenna	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/29/07	4/29/09
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303a01690	CAL 12/8/05	12/8/07
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 12/7/05	12/7/07
Analyzer Tan Tower Spectrum Analyzer	HP	8566B OPT 462	3188A07786 3144A20661	CAL 12/7/05	12/7/07
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 12/8/05	12/8/07
LISN	Electro-Metrics	EM-7820	2682	CAL 4/28/07	4/28/09
Log-Periodic Antenna	Eaton	96005	1243	CAL 12/14/05	12/14/07
Double-Rigged Horn Antenna	ETS-Lindgren	3117	00035923	9/27/06	9/27/08
Std gain Horn Antenna	Polarad	18 – 26 GHz	Not Serialized	Not required	Not Required

TEST PROCEDURES

(When applicable)

Power Line Conducted Interference: The procedure used was ANSI C63.4-2003 using a 50uH LISN. The resolution bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

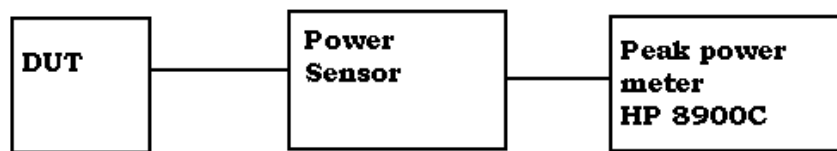
Bandwidth 20 dB: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

Power Output:

With antenna connector:

Power was measured by disconnecting the antenna and measuring across a 50 ohm load using a HP peak power meter Model 8900C.

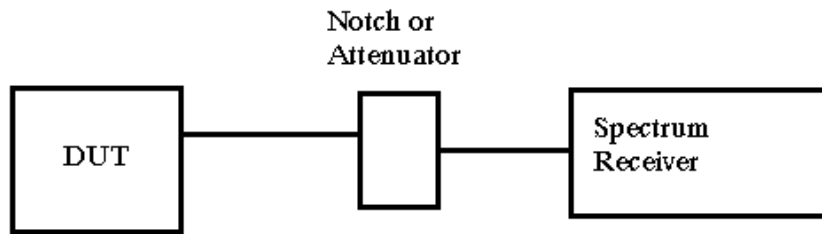
Output Power Test Setup Diagram



Without antenna connected: The power is measured is conducted.

Antenna Conducted Emissions: The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10th Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

RF Conducted Spurious Emissions Test Setup Diagram

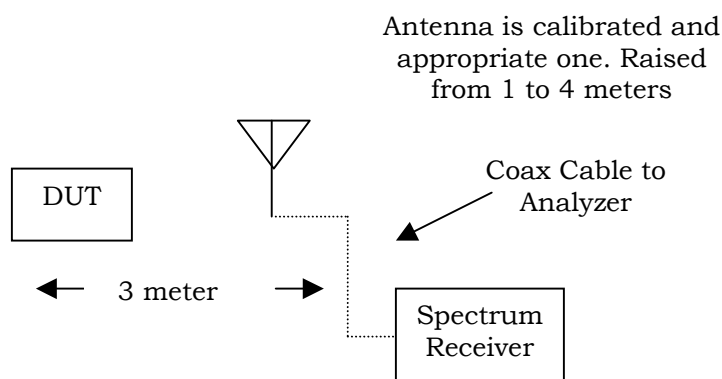


Note: The spectrum was scanned to the tenth harmonic.

Radiation Interference: The test procedure used was ANSI C63.4-2003 using an Agilent spectrum receiver with preselector. The bandwidth (RBW) of the spectrum receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

Radiated Spurious Emissions Into Adjacent Restricted Band: An inband field strength measurement of the fundamental emission at the lowest and highest frequencies was made using the RBW and detector function required by C63.4-2003 and FCC Rules.

Radiated Spurious Emissions: The procedure used was ANSI standard C63.4-2003 & the FCC/OET Guidance on Measurements.



DUT is placed 80 cm above groundplane on a rotatable platform

POWER LINE CONDUCTED INTERFERENCE

Rules Part No.: 15.207(a)

Requirements:

Emission Frequency (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak (QP)	Average (AV)
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50
* Decreases with the logarithm of the frequency.		

Test Data: Not applicable. The device uses non-standard power source.

FIELD STRENGTH OF SPURIOUS EMISSIONS

Rules Part No.: 15.247(c), 15.205 & 15.209(b)

Requirements:

(Fundamental) Frequency	Limits
902 – 928MHz 2.4 – 2.4835GHz	127.37dBuV/m

Unwanted Emissions Frequency	Limits dBuV/m @ 3m
30 - 88	40
88 - 216	43.5
216 - 960	46
Above 960 MHz	54

Spurious emissions that fall in the restricted bands (15.205) must be less than or equal to 500 uV/m (54 dBuV/m). Spurious emissions not in a restricted band must be 20 dBc.

Test Data: The data is presented in the following tables.

Harmonics were measured to the 10th harmonic.

All emissions measured using a peak detector. Except as noted.

Emissions attenuated more than 20 dB below the limit are not reported

B-MODE PEAK

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB/m	Correction Factor dB	Field Strength dBuV/m	Margin dB
2,412.00	2,412.00	60.4	H	3.19	32.35	95.94	31.44
2,412.00	2,412.00	70.2	V	3.19	32.35	105.74	21.64
2,412.00	4,824.00	5.6	H	4.91	34.36	44.87	29.13
2,412.00	4,824.00	7.1	V	4.91	34.36	46.37	27.63
2,412.00	7,236.00	8.7	V	5.74	36.18	50.62	23.38
2,412.00	7,236.00	9.4	H	5.74	36.18	51.32	22.68
2,412.00	9,648.00	7.9	V	6.79	37.58	52.27	21.73
2,412.00	9,648.00	8.8	H	6.79	37.58	53.17	20.83
2,412.00	12,060.00	8.2	H	7.84	38.92	54.96	19.04
2,412.00	12,060.00	8.2	V	7.84	38.92	54.96	19.04
2,412.00	14,472.00	12.9	V	9.09	40.54	62.53	11.47
2,412.00	14,472.00	13.1	H	9.09	40.54	62.73	11.27
2,412.00	16,884.00	12.6	H	10.23	42.29	65.12	8.88
2,412.00	16,884.00	12.8	V	10.23	42.29	65.32	8.68
2,437.00	2,437.00	70.5	H	3.21	32.42	106.13	21.25
2,437.00	2,437.00	79.8	V	3.21	32.42	115.43	11.95
2,437.00	4,874.00	8.4	H	4.94	34.4	47.74	26.26
2,437.00	4,874.00	9.7	V	4.94	34.4	49.04	24.96
2,437.00	7,311.00	7.9	H	5.79	36.27	49.96	24.04
2,437.00	7,311.00	8.9	V	5.79	36.27	50.96	23.04
2,437.00	9,748.00	9.5	H	6.82	37.7	54.02	19.98
2,437.00	9,748.00	9.7	V	6.82	37.7	54.22	19.78
2,437.00	12,185.00	7.8	H	7.93	38.97	54.7	19.3
2,437.00	12,185.00	8.1	V	7.93	38.97	55	19
2,437.00	14,622.00	11.8	H	9.15	40.65	61.6	12.4
2,437.00	14,622.00	13.2	V	9.15	40.65	63	11
2,437.00	17,059.00	13	H	10.32	42.27	65.59	8.41
2,437.00	17,059.00	13.1	V	10.32	42.27	65.69	8.31

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B-MODE PEAK

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB/m	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,462.00	2,462.00	64.4	H	3.22	32.49	100.11	27.27
2,462.00	2,462.00	71.9	V	3.22	32.49	107.61	19.77
2,462.00	4,924.00	6.4	V	4.96	34.44	45.8	28.2
2,462.00	4,924.00	7.7	H	4.96	34.44	47.1	26.9
2,462.00	7,386.00	8.6	V	5.83	36.36	50.79	23.21
2,462.00	7,386.00	8.8	H	5.83	36.36	50.99	23.01
2,462.00	9,848.00	8.1	V	6.85	37.82	52.77	21.23
2,462.00	9,848.00	8.8	H	6.85	37.82	53.47	20.53
2,462.00	12,310.00	8.3	V	8.02	39.02	55.34	18.66
2,462.00	12,310.00	8.7	H	8.02	39.02	55.74	18.26
2,462.00	14,772.00	12.4	V	9.21	40.71	62.32	11.68
2,462.00	14,772.00	13.7	H	9.21	40.71	63.62	10.38
2,462.00	17,234.00	12.6	V	10.37	42.48	65.45	8.55
2,462.00	17,234.00	13.5	H	10.37	42.48	66.35	7.65

B-MODE Average

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB/m	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,412.0	12,060.00	-3.0	V	7.84	38.92	43.76	10.24
2,412.0	12,060.00	-2.9	H	7.84	38.92	43.86	10.14
2,412.0	14,472.00	1.2	V	9.09	40.54	50.83	3.17
2,412.0	14,472.00	1.3	H	9.09	40.54	50.93	3.07
2,412.0	16,884.00	1.2	V	10.23	42.29	53.72	0.28
2,412.0	16,884.00	1.4	H	10.23	42.29	53.92	0.08
2,437.0	9,748.00	-0.5	V	6.82	37.70	44.02	9.98
2,437.0	9,748.00	-0.3	H	6.82	37.70	44.22	9.78
2,437.0	12,185.00	-2.9	V	7.93	38.97	44.00	10.00
2,437.0	12,185.00	-2.8	H	7.93	38.97	44.10	9.90
2,437.0	14,622.00	1.5	H	9.15	40.65	51.30	2.70
2,437.0	14,622.00	1.5	V	9.15	40.65	51.30	2.70
2,437.0	17,059.00	1.4	H	10.32	42.27	53.99	0.01
2,437.0	17,059.00	1.4	V	10.32	42.27	53.99	0.01

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B-MODE Average

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB/m	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,462.0	12,310.00	-3.0	V	8.02	39.02	44.04	9.96
2,462.0	12,310.00	-3.0	H	8.02	39.02	44.04	9.96
2,462.0	14,772.00	1.6	V	9.21	40.71	51.52	2.48
2,462.0	14,772.00	1.6	H	9.21	40.71	51.52	2.48
2,462.0	17,234.00	1.0	V	10.37	42.48	53.85	0.15
2,462.0	17,234.00	1.0	H	10.37	42.48	53.85	0.15

G-MODE PEAK

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB/m	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,412.00	2,412.00	67.6	H	3.19	32.35	103.14	24.24
2,412.00	2,412.00	71.8	V	3.19	32.35	107.34	20.04
2,412.00	4,824.00	5.8	V	4.91	34.36	45.07	28.93
2,412.00	4,824.00	9.1	H	4.91	34.36	48.37	25.63
2,412.00	7,236.00	7.9	H	5.74	36.18	49.82	24.18
2,412.00	7,236.00	8.7	V	5.74	36.18	50.62	23.38
2,412.00	9,648.00	8.4	V	6.79	37.58	52.77	21.23
2,412.00	9,648.00	9.3	H	6.79	37.58	53.67	20.33
2,412.00	12,060.00	8.4	V	7.84	38.92	55.16	18.84
2,412.00	12,060.00	8.7	H	7.84	38.92	55.46	18.54
2,412.00	14,472.00	12.9	H	9.09	40.54	62.53	11.47
2,412.00	14,472.00	13.7	V	9.09	40.54	63.33	10.67
2,412.00	16,884.00	12.8	H	10.23	42.29	65.32	8.68
2,412.00	16,884.00	12.9	V	10.23	42.29	65.42	8.58

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G-MODE PEAK

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB/m	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,437.00	2,437.00	74.7	H	3.21	32.42	110.33	17.05
2,437.00	2,437.00	79.3	V	3.21	32.42	114.93	12.45
2,437.00	4,874.00	6.6	H	4.94	34.4	45.94	28.06
2,437.00	4,874.00	6.9	V	4.94	34.4	46.24	27.76
2,437.00	7,311.00	8.5	H	5.79	36.27	50.56	23.44
2,437.00	7,311.00	8.7	V	5.79	36.27	50.76	23.24
2,437.00	9,748.00	8	H	6.82	37.7	52.52	21.48
2,437.00	9,748.00	8.4	V	6.82	37.7	52.92	21.08
2,437.00	12,185.00	7.9	V	7.93	38.97	54.8	19.2
2,437.00	12,185.00	8.9	H	7.93	38.97	55.8	18.2
2,437.00	14,622.00	12.5	H	9.15	40.65	62.3	11.7
2,437.00	14,622.00	12.9	V	9.15	40.65	62.7	11.3
2,437.00	17,059.00	12.7	V	10.32	42.27	65.29	8.71
2,437.00	17,059.00	13.2	H	10.32	42.27	65.79	8.21
2,462.00	2,462.00	70	H	3.22	32.49	105.71	21.67
2,462.00	2,462.00	72.4	V	3.22	32.49	108.11	19.27
2,462.00	4,924.00	6.4	V	4.96	34.44	45.8	28.2
2,462.00	4,924.00	7.8	H	4.96	34.44	47.2	26.8
2,462.00	7,386.00	9	V	5.83	36.36	51.19	22.81
2,462.00	7,386.00	9.2	H	5.83	36.36	51.39	22.61
2,462.00	9,848.00	8.4	V	6.85	37.82	53.07	20.93
2,462.00	9,848.00	8.9	H	6.85	37.82	53.57	20.43
2,462.00	12,310.00	7.3	V	8.02	39.02	54.34	19.66
2,462.00	12,310.00	8.5	H	8.02	39.02	55.54	18.46
2,462.00	14,772.00	12.6	V	9.21	40.71	62.52	11.48
2,462.00	14,772.00	13.2	H	9.21	40.71	63.12	10.88
2,462.00	17,234.00	12.4	H	10.37	42.48	65.25	8.75
2,462.00	17,234.00	12.5	V	10.37	42.48	65.35	8.65

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G-MODE Average

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB/m	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,412.0	12,060.00	-3.0	H	7.84	38.92	43.76	10.24
2,412.0	12,060.00	-3.0	V	7.84	38.92	43.76	10.24
2,412.0	14,472.00	1.1	H	9.09	40.54	50.73	3.27
2,412.0	14,472.00	1.2	V	9.09	40.54	50.83	3.17
2,412.0	16,884.00	1.4	V	10.23	42.29	53.92	0.08
2,412.0	16,884.00	1.4	H	10.23	42.29	53.92	0.08
2,437.0	12,185.00	-2.9	V	7.93	38.97	44.00	10.00
2,437.0	12,185.00	-2.8	H	7.93	38.97	44.10	9.90
2,437.0	14,622.00	1.4	H	9.15	40.65	51.20	2.80
2,437.0	14,622.00	1.4	V	9.15	40.65	51.20	2.80
2,437.0	17,059.00	1.4	H	10.32	42.27	53.99	0.01
2,437.0	17,059.00	1.4	V	10.32	42.27	53.99	0.01
2,462.0	12,310.00	-3.0	H	8.02	39.02	44.04	9.96
2,462.0	12,310.00	-2.9	V	8.02	39.02	44.14	9.86
2,462.0	14,772.00	1.6	H	9.21	40.71	51.52	2.48
2,462.0	14,772.00	1.6	V	9.21	40.71	51.52	2.48
2,462.0	17,234.00	1.1	H	10.37	42.48	53.95	0.05
2,462.0	17,234.00	1.1	V	10.37	42.48	53.95	0.05