

EXHIBIT A

[FCC Ref. 2.1033(b)(6)]

"Report of Measurements"

LIST OF EXHIBITS

Exhibit A(1)	List of Exhibits
Exhibit A(2)	Product Description
Exhibit A(3)-1	15.107(a) Power Line Conducted Interference
Exhibit A(3)-2 to -10	15.205(c)/15.209 Spurious Radiated Emissions in Restricted Bands and Field Strength of Emissions
Exhibit A(3)-11	15.247(a)(1) Hopping Channel Separation
Exhibit A(3)-12	15.247(a)(1) Frequency Hopping Systems (Number of Hopping Frequencies Used)
Exhibit A(3)-13	15.247(a)(1) Frequency Hopping Systems (Channel Bandwidth)
Exhibit A(3)-14	15.247(a)(1) Frequency Hopping Systems (Dwell Time)
Exhibit A(3)-15	15.247(b)(1) Maximum Peak Output Power [EIRP]
Exhibit A(3)-16	15.247(d) Bandwidth of Band Edge Measurement
Exhibit A(3)-17	15.247(g) and 15.247(h)
Exhibit A(4)-1 to -3	Test Equipment List and Facility
Exhibit A(5)-1 to -2	Frequency List Table
Exhibit A(6)-1 to -2	Test Setup Photos
Exhibit A(7)	Test Setup Diagram for Power Line Conducted Testing
Exhibit A(8)-1 to -3	FCC RF Exposure Requirements
Exhibit A(9)-1 to -73	SAR Report
Appendix 1 to 4	Plots for Power Line Conducted Interference
Appendix 5 to 13	Plots for Hopping Channel Separation
Appendix 14 to 17	Plots for Number of Hopping Frequencies Used
Appendix 18 to 26	Plots for 20 dB Bandwidth
Appendix 27 to 30	Plots for Dwell Time
Appendix 31 to 36	Plots for Band Edge

PRODUCT DESCRIPTION

The ATLINKS USA, Inc. Model 28021XXX-A is a 5.8GHz single-line, frequency hopping spread spectrum, cordless telephone with caller ID, handset speakerphone, dual handsets, remote charger [Model 5-2702] and up to four multi-handset expandability, that operates from 5725.809328 MHz to 5848.889420 MHz. The antenna used for the base and the handset are permanently attached to the EUT.

Refer to Exhibit A(5) for complete frequency list.

NOTE: The base and handset use **75** Channels.

15.107 (a) POWER LINE CONDUCTED INTERFERENCE

Requirements:

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
	56	46
38136	60	50

*Decreases with the logarithm of the frequency.

Test Procedure:

ANSI STANDARD C63.4-2003 using a 50 μ H LISN. Both lines were observed with the EUT transmitting. The bandwidth of the spectrum analyzer was 9KHz QP with an appropriate sweep speed. The ambient temperature of the EUT was 24°C with a humidity of 60%.

The spectrum was scanned from 0.15 to 30MHz.

Test Data:

Base Unit

The highest emission read for PHASE was **25.74 dB μ V@ 0.15 MHz**.
The highest emission read for NEUTRAL was **27.17 dB μ V@ 0.15 MHz**.

Handset Charger Unit

The highest emission read for PHASE was **20.21 dB μ V@ 0.15 MHz**.
The highest emission read for NEUTRAL was **25.71 dB μ V@ 0.15 MHz**.

Refer to Appendix 1 to 4 for the plots.

Test Results:

Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

15.205(c)/15.209

SPURIOUS RADIATED EMISSIONS IN RESTRICTED BANDS

Procedure

The test procedure used was ANSI STANDARD C63.4-2003 and DA-00-705 using an appropriate spectrum analyzer, as listed in the Test Equipment List. The bandwidth (RBW) of the spectrum analyzer was 100KHz/120KHz up to 1GHz with an appropriate sweep speed. The RBW above 1.0GHz was = 1.0MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the EUT was 24°C with a humidity of 60%.

Requirements:

Emissions that fall in the restricted bands (15.205) must be less than 54dB μ V/m.

Test Data:

Refer to Exhibits A(3)-3 to -10

15.205(c)/15.209

FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS**BASE UNIT (ANT0)**

Frequency Band MHz	Meter Reading (Peak) @3m dB μ V/M	Meter Reading (Average) @3m dB μ V/M	Antenna and Polarization	Cable & Antenna Factor	Peak F. S. dB μ V/M	Average F. S. dB μ V/M	FCC Limit dB μ V/M	Margin dB
Channel 1								
5725.809	79.00	—	Horn V	39.65	118.65	—	—	—
5460.00	15.00	1.00	Horn V	39.93	54.93	40.93	54	-13.07
11451.618	16.00	5.00	Horn H	40.91	56.91	45.91	54	-8.09
17177.427	24.00	—	Horn H	46.84	70.84	—	98.65 (dbc)	-27.81
22903.236	11.00	3.00	Horn H	49.18	60.18	52.18	54	-1.82
Channel 71								
5788.240	78.00	—	Horn V	39.84	117.84	—	—	—
5460.00	15.00	1.00	Horn V	39.93	54.93	40.93	54	-13.07
11576.480	15.00	5.00	Horn H	40.95	55.95	45.95	54	-8.05
17364.720	24.00	—	Horn H	46.66	70.66	—	97.84 (dbc)	-27.18
23152.961	11.00	3.00	Horn H	49.50	60.50	52.50	54	-1.50

1. If the peak meets the average limit, nothing further is required.
2. If the peak exceeds the average limit, then an average measurement is required (may be calculated) and must be below the average limit and also:
3. The peak measurement cannot exceed the average limit +20dB.

15.205(c)/15.209

FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS

BASE UNIT (ANT0)

1. If the peak meets the average limit, nothing further is required.
2. If the peak exceeds the average limit, then an average measurement is required (may be calculated) and must be below the average limit and also:
 3. The peak measurement cannot exceed the average limit +20dB.

15.205(c)/15.209

FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS**BASE UNIT (ANT0)**

Emission Frequency MHz	Meter Reading @3m dB μ V/M (Peak)	Antenna Polarity	Total Correction Factor dB	Field Strength dB μ V/M (Peak)	FCC Limit dB	Margin dB	Detector & BW KHz
Channel 1							
28629.045	36.00	V	56.04	92.04	98.65	-6.61	PK 1000
34354.854	36.00	V	58.25	94.25	98.65	-4.40	PK 1000
Channel 71							
28941.200	36.00	V	56.15	92.15	97.84	-5.69	PK 1000
34729.440	36.00	V	58.40	94.40	97.84	-3.44	PK 1000
Channel 139							
29244.445	36.00	V	56.26	92.26	97.50	-5.24	PK 1000
35093.334	36.00	V	58.57	94.57	97.50	-2.93	PK 1000

15.205(c)/15.209**FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS****BASE UNIT (ANT1)**

Frequency Band MHz	Meter Reading (Peak) @3m dB μ V/M	Meter Reading (Average) @3m dB μ V/M	Antenna and Polarization	Cable & Antenna Factor	Peak F. S. dB μ V/M	Average F. S. dB μ V/M	FCC Limit dB μ V/M	Margin dB
Channel 1								
5725.809	78.00	—	Horn V	39.65	117.65	—	—	—
5460.00	15.00	1.00	Horn V	39.93	54.93	40.93	54	-13.07
11451.618	16.00	5.00	Horn H	40.91	56.91	45.91	54	-8.09
17177.427	23.00	—	Horn H	46.84	69.84	—	97.65 (dbc)	-27.81
22903.236	11.00	3.00	Horn H	49.18	60.18	52.18	54	-1.82
Channel 71								
5788.240	77.00	—	Horn V	39.84	116.84	—	—	—
5460.00	15.00	1.00	Horn V	39.93	54.93	40.93	54	-13.07
11576.480	15.00	5.00	Horn H	40.95	55.95	45.95	54	-8.05
17364.720	23.00	—	Horn H	46.66	69.66	—	96.84 (dbc)	-27.18
23152.961	11.00	3.00	Horn H	49.50	60.50	52.50	54	-1.50

1. If the peak meets the average limit, nothing further is required.
2. If the peak exceeds the average limit, then an average measurement is required (may be calculated) and must be below the average limit and also:
3. The peak measurement cannot exceed the average limit +20dB.

15.205(c)/15.209

FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS

BASE UNIT (ANT1)

1. If the peak meets the average limit, nothing further is required.
2. If the peak exceeds the average limit, then an average measurement is required (may be calculated) and must be below the average limit and also:
 3. The peak measurement cannot exceed the average limit +20dB.

15.205(c)/15.209

FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS**BASE UNIT (ANT1)**

Emission Frequency MHz	Meter Reading @3m dB μ V/M (Peak)	Antenna Polarity	Total Correction Factor dB	Field Strength dB μ V/M (Peak)	FCC Limit dB	Margin dB	Detector & BW KHz
Channel 1							
28629.045	35.00	V	56.04	91.04	97.65	-6.61	PK 1000
34354.854	35.00	V	58.25	93.25	97.65	-4.40	PK 1000
Channel 71							
28941.200	35.00	V	56.15	91.15	96.84	-5.69	PK 1000
34729.440	35.00	V	58.40	93.40	96.84	-3.44	PK 1000
Channel 139							
29244.445	35.00	V	56.26	91.26	96.50	-5.24	PK 1000
35093.334	35.00	V	58.57	93.57	96.50	-2.93	PK 1000

15.205(c)/15.209

FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS**HANDSET UNIT**

Frequency Band MHz	Meter Reading (Peak) @3m dB μ V/M	Meter Reading (Average) @3m dB μ V/M	Antenna and Polarization	Cable & Antenna Factor	Peak F. S. dB μ V/M	Average F. S. dB μ V/M	FCC Limit dB μ V/M	Margin dB
Channel 1								
5725.809	78.00	—	Horn H	39.65	117.65	—	—	—
11451.618	19.00	3.00	Horn H	40.91	59.91	43.91	54	-10.09
17177.427	28.00	—	Horn V	46.84	74.84	—	97.65 (dbc)	-22.81
22903.236	16.00	-3.00	Horn V	49.18	65.18	46.18	54	-7.82
Channel 71								
5788.240	78.00	—	Horn H	39.84	117.84	—	—	—
11576.480	21.00	5.00	Horn H	40.95	61.95	45.95	54	-8.05
17364.720	28.00	—	Horn V	46.66	74.66	—	97.84 (dbc)	-23.18
23152.961	16.00	-3.00	Horn V	49.50	65.50	46.50	54	-7.50
Channel 139								
5848.889	79.00	—	Horn H	39.50	118.50	—	—	—
11697.778	23.00	5.00	Horn H	40.99	63.99	45.99	54	-8.01
17546.668	28.00	—	Horn V	46.39	74.39	—	98.5 (dbc)	-24.11
23395.557	16.00	-3.00	Horn V	49.33	65.33	46.33	54	-7.67

1. If the peak meets the average limit, nothing further is required.
2. If the peak exceeds the average limit, then an average measurement is required (may be calculated) and must be below the average limit and also:
 3. The peak measurement cannot exceed the average limit +20dB.

15.205(c)/15.209**FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS****HANDSET UNIT**

Emission Frequency MHz	Meter Reading @3m dBμV/M (Peak)	Antenna Polarity	Total Correction Factor dB	Field Strength dBμV/M (Peak)	FCC Limit dB	Margin dB	Detector & BW KHz
Channel 1							
28629.045	32.00	V	56.04	88.04	97.65	-9.61	PK 1000
34354.854	32.00	V	58.25	90.25	97.65	-7.40	PK 1000
Channel 71							
28941.200	32.00	V	56.15	88.15	97.84	-9.69	PK 1000
34729.440	32.00	V	58.40	90.40	97.84	-7.44	PK 1000
Channel 139							
29244.445	32.00	V	56.26	88.26	98.50	-10.24	PK 1000
35093.334	32.00	V	58.57	90.57	98.50	-7.93	PK 1000

15.247(a)(1) HOPPING CHANNEL SEPARATION

Requirements:

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

Measurement Procedure

1. Position the EUT without connection to the Spectrum Analyzer (SA). Turn on the EUT and connect it to the SA. Then set it to any one convenient frequency within its operating range.
2. By using the Max Hold function record the separation of two adjacent channels.
3. Measure the frequency difference of these two adjacent channels by SA MARK function and then plot the result on the SA screen.
4. Repeat above procedures until all frequencies measured were complete.

Measurement Data - Refer Appendix 5 to 13 for plotted data

Base (ANT0)

Channel 1 & 2: Adjacent Hopping Channel Separation is **892 kHz**.
Channel 71 & 72: Adjacent Hopping Channel Separation is **894 kHz**.
Channel 138 & 139: Adjacent Hopping Channel Separation is **892 kHz**.

Base (ANT1)

Channel 1 & 2: Adjacent Hopping Channel Separation is **892 kHz**.
Channel 71 & 72: Adjacent Hopping Channel Separation is **894 kHz**.
Channel 138 & 139: Adjacent Hopping Channel Separation is **892 kHz**.

Handset Unit

Channel 1 & 2: Adjacent Hopping Channel Separation is **892 kHz**.
Channel 71 & 72: Adjacent Hopping Channel Separation is **894 kHz**.
Channel 138 & 139: Adjacent Hopping Channel Separation is **892 kHz**.

15.247(a)(1) FREQUENCY HOPPING SYSTEMS

Page 1 of 3

NUMBER OF HOPPING FREQUENCIES USED

Requirements:

Frequency hopping systems operating in the 5725-5850 MHz band shall use at least 75 hopping frequencies.

Measurement Procedure

1. Position the EUT without connection to Spectrum Analyzer (SA). Turn on the EUT and connect its antenna terminal to SA via a low loss cable and set it to any one measured frequency within its operating range and ensure that the SA is operated in its linear range.
2. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all of the signals from each channel until each one has been recorded.
3. Set the SA on View mode and plot the results on SA screen.
1. Repeat the above procedures until all frequencies measured are complete.

Measurement Data

The base has **75** hopping frequencies.

For plotted data, refer to Appendix 14 (showing 35 channels) and to Appendix 15 (showing 40 channels).

The handset has **75** hopping frequencies.

For plotted data, refer to Appendix 16 (showing 35 channels) and to Appendix 17 (showing 40 channels).

15.247(a)(1) FREQUENCY HOPPING SYSTEMS (continued)

Page 2 of 3

CHANNEL BANDWIDTH

Requirements:

The maximum 20dB bandwidth of the hopping channel is 1 MHz.

Measurement Procedure

1. Position the EUT without connection to the Spectrum Analyzer (SA). Turn on the EUT and connect it to the SA. Then set it to any one convenient frequency within its operating range. Set a reference level on the SA equal to the highest peak value.
2. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
3. Repeat above procedures until all frequencies measured were complete.

Measurement Data – Refer Appendix 18 to 26 for plotted data

<u>Base (ANT0)</u>	Channel 1:	Channel Bandwidth is 663 kHz .
	Channel 71:	Channel Bandwidth is 672 kHz .
	Channel 139:	Channel Bandwidth is 666 kHz .

<u>Base (ANT1)</u>	Channel 1:	Channel Bandwidth is 672 kHz .
	Channel 71:	Channel Bandwidth is 680 kHz .
	Channel 139:	Channel Bandwidth is 669 kHz .

<u>Handset Unit</u>	Channel 1:	Channel Bandwidth is 680 kHz .
	Channel 71:	Channel Bandwidth is 691 kHz .
	Channel 139:	Channel Bandwidth is 690 kHz .

15.247(a)(1) FREQUENCY HOPPING SYSTEMS (continued)

Page 3 of 3

DWELL TIME ON EACH CHANNEL

Requirements:

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

Measurement Procedure

1. Position the EUT without connection to Spectrum Analyzer (SA). Turn on the EUT and connect its antenna terminal to SA via a low loss cable and set it to any one measured frequency within its operating range and ensure that the SA is operated in its linear range.
2. Adjust the centre frequency of SA on any frequency to be measured and set SA to zero span mode. Set RBW and VBW of SA to proper value.
3. Measure the time duration of one transmission on the measured frequency and then plot the result with the time difference of this time duration.
4. Repeat the above procedures until all frequencies measured were complete.

Measurement Data – Refer Appendix 27 to 30 for plotted data.

Base (ANT0 and ANT1)

The dwell time is **(1.05 mS x 4) x 40 = 168 mS**

The maximum time of occupancy for a particular channel is **168 mS** in any 30 second period.

Handset Unit

The dwell time is **(1.05 mS x 1) x 40 = 42 mS**

The maximum time of occupancy for a particular channel is **42 mS** in any 30 second period.

15.247(b) (1) MAXIMUM PEAK OUTPUT POWER [EIRP]

Requirements:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHZ band: **1 Watt**. For all other frequency hopping systems in the 2400-2483.5 band: **0.125 Watt**.

Measurement Data

Base (ANT0)

Channel 1:	Output Peak Power is 0.220 W.	[EIRP]
Channel 71:	Output Peak Power is 0.182 W.	[EIRP]
Channel 139:	Output Peak Power is 0.168 W.	[EIRP]

Base (ANT1)

Channel 1:	Output Peak Power is 0.174 W.	[EIRP]
Channel 71:	Output Peak Power is 0.145 W.	[EIRP]
Channel 139:	Output Peak Power is 0.134 W.	[EIRP]

Handset Unit

Channel 1:	Output Peak Power is 0.175 W.	[EIRP]
Channel 71:	Output Peak Power is 0.182 W.	[EIRP]
Channel 139:	Output Peak Power is 0.212 W.	[EIRP]

15.247(d) BANDWIDTH OF BAND EDGE MEASUREMENT

Requirements:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Measurement Procedure

1. Position the EUT without connection to Spectrum Analyzer (SA). Turn on the EUT and connect its antenna terminal to SA via a low loss cable and set it to any one measured frequency within its operating range and ensure that the SA is operated in its linear range.
2. Set RBW to 120 kHz and suitable frequency span 500 KHz or 1000 kHz; VBW = none.
3. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
4. Repeat the above procedures until all frequencies measured were complete.
5. Note: Measurements made with hopping and modulation.

Measurement Data - Refer Appendix 31 to 36 for plotted data

Base (ANT0)

Channel 1: All emissions in this 100 kHz bandwidth are attenuated more than **38.12 dB**.
Channel 139: All emissions in this 100 kHz bandwidth are attenuated more than **45.00 dB**.

Base (ANT1)

Channel 1: All emissions in this 100 kHz bandwidth are attenuated more than **39.37 dB**.
Channel 139: All emissions in this 100 kHz bandwidth are attenuated more than **44.99 dB**.

Handset Unit

Channel 1: All emissions in this 100 kHz bandwidth are attenuated more than **39.37 dB**.
Channel 139: All emissions in this 100 kHz bandwidth are attenuated more than **49.37 dB**.

Part 15.247(g): Exhibit C(2)-17 provides information on how the system is designed while the transmitter is presented with a continuous voice stream and a description of the system transmitting short bursts.

Part 15.247(h): Exhibit C(2)-18 provides information concerning the avoidance of simultaneous occupancy of hopping frequencies by multiple transmitters, system synchronization procedure, frequency hopping algorithm, hopping tables, and dual slot diversity.