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AirMagnet 802.11a/b/g/n Wireless PC Card (C1060) Technical Specifications

Datasheet
AirMagnet, Inc.
June 2008

Technical Specifications

Main Chipset	➤ Atheros® AR5416, AR5133																																																		
Frequency range	➤ USA: 2.400 ~ 2.483GHz, 5.15 ~ 5.35GHz, 5.725 ~ 5.825GHz ➤ Europe: 2.400 ~ 2.483GHz, 5.15 ~ 5.35GHz, 5.47 ~ 5.725GHz																																																		
Modulation technique	➤ 802.11n a/b/g DSSS (DBPSK, DQPSK, CCK) OFDM (BPSK, QPSK, 16-QAM, 64-QAM) DSSS (Direct Sequence Spread Spectrum) with DBPSK (Differential Binary Phase Shift Keying 1Mbps), DQPSK (Differential Quaternary Phase Shift Keying 2Mbps), and CCK (Complementary Code Keying 5.5&11Mbps), and OFDM (Orthogonal Frequency Division Multiplexing with BPSK for 6,9Mbps, QPSK for 12,18Mbps, 16QAM for 24,36Mbps, 64QAM for 48,54Mbps)																																																		
Host interface	➤ Cardbus form factor with 32-bit interface																																																		
Channels support	➤ 802.11n b/g US/Canada: 11 (1 ~ 11) Major European country: 13 (1 ~ 13) France: 4 (10 ~ 13) ➤ 802.11n a 1). US/Canada: 12 non-overlapping channels (36,40,44,48,52,56,60,64; 149,153,157,161) 2). Europe: 19 non-overlapping channel (36,40,44,48,52,56,60,64; 100,104,108,112,116,120,124,128,132,136,140)																																																		
Operation voltage	➤ 3.3V +/- 5%																																																		
Power consumption @25° C & Win2K environment	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">802.11a</th> <th style="text-align: center;">802.11b</th> <th style="text-align: center;">802.11g</th> <th style="text-align: center;">802.11n(2.4GHz)</th> <th style="text-align: center;">802.11n(5GHz)</th> </tr> <tr> <th></th> <th style="text-align: center;">Avg/Max (mA)</th> <th style="text-align: center;">Avg/Max</th> <th style="text-align: center;">Avg/Max</th> <th style="text-align: center;">Avg/Max (mA)</th> <th style="text-align: center;">Avg/Max (mA)</th> </tr> </thead> <tbody> <tr> <td>➤ Continue Tx</td> <td style="text-align: center;">615/716</td> <td style="text-align: center;">614/720</td> <td style="text-align: center;">547/639</td> <td style="text-align: center;">584/685</td> <td style="text-align: center;">632/732</td> </tr> <tr> <td>➤ FTP Tx</td> <td style="text-align: center;">384/600</td> <td style="text-align: center;">487/640</td> <td style="text-align: center;">351/480</td> <td style="text-align: center;">486/669</td> <td style="text-align: center;">572/698</td> </tr> <tr> <td>➤ FTP Rx</td> <td style="text-align: center;">433/524</td> <td style="text-align: center;">379/611</td> <td style="text-align: center;">386/499</td> <td style="text-align: center;">406/653</td> <td style="text-align: center;">474/676</td> </tr> <tr> <td>➤ Standby mode</td> <td style="text-align: center;">437/502</td> <td style="text-align: center;">393/485</td> <td style="text-align: center;">391/468</td> <td style="text-align: center;">383/456</td> <td style="text-align: center;">393/490</td> </tr> <tr> <td>➤ Power saving</td> <td style="text-align: center;">38/487</td> <td style="text-align: center;">41/447</td> <td style="text-align: center;">42/454</td> <td style="text-align: center;">42/417</td> <td style="text-align: center;">101/426</td> </tr> </tbody> </table> <p>***The maximum current consumption would be impacted by radiation environment and the driver mechanism.</p>		802.11a	802.11b	802.11g	802.11n(2.4GHz)	802.11n(5GHz)		Avg/Max (mA)	Avg/Max	Avg/Max	Avg/Max (mA)	Avg/Max (mA)	➤ Continue Tx	615/716	614/720	547/639	584/685	632/732	➤ FTP Tx	384/600	487/640	351/480	486/669	572/698	➤ FTP Rx	433/524	379/611	386/499	406/653	474/676	➤ Standby mode	437/502	393/485	391/468	383/456	393/490	➤ Power saving	38/487	41/447	42/454	42/417	101/426								
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Test Freq	MCS 0/8	MCS 1/9	MCS 2/10	MCS 3/11	MCS 4/12	MCS 5/13	MCS 6/14	MCS 7/15																																																																																																																																																																																																																																																																																									
2412	18	18	18	16	16	15	13	12																																																																																																																																																																																																																																																																																									
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	QPSK	1/2	-10	-20/-15
	QPSK	3/4	-13	-21/-17
	16-QAM	1/2	-16	-21/-17
	16-QAM	3/4	-19	-25/-21
	64-QAM	2/3	-22	-26/-23
	64-QAM	3/4	-25	-28/-25
➤	802.11b			
	Modulation	Code Rate	Relative constellation error (dB)	Relative constellation error (dB)
			IEEE Spec (1Tx dB)	Typical/Maximum (2Tx dB)
	DBPSK		-10	-18/-15
	DQPSK		-10	-18/-15
	CCK		-10	-18/-15
➤	802.11g			
	Modulation	Code Rate	Relative constellation error (dB)	Relative constellation error (dB)
			IEEE Spec (1Tx dB)	Typical/Maximum (2Tx dB)
	BPSK	1/2	-5	-21/-15
	BPSK	3/4	-8	-21/-15
	QPSK	1/2	-10	-21/-15
	QPSK	3/4	-13	-23/-20
	16-QAM	1/2	-16	-25/-20
	16-QAM	3/4	-19	-27/-22
	64-QAM	2/3	-22	-28/-25
	64-QAM	3/4	-25	-30/-27
➤	802.11ng			
	Modulation	Code Rate	Relative constellation error (dB)	Relative constellation error (dB)
			IEEE Spec (1Tx dB)	Typical/Maximum (2Tx dB)
✧	HT20			
	BPSK	1/2	-5	-20/-15
	QPSK	1/2	-10	-20/-16
	QPSK	3/4	-13	-20/-16
	16-QAM	1/2	-16	-25/-20
	16-QAM	3/4	-19	-29/-22
	64-QAM	2/3	-22	-29/-24
	64-QAM	3/4	-25	-30/-26
	64-QAM	5/6	-28	-31/-28
✧	HT40			
	BPSK	1/2	-5	-21/-15
	QPSK	1/2	-10	-21/-15
	QPSK	3/4	-13	-21/-15
	16-QAM	1/2	-16	-25/-20
	16-QAM	3/4	-19	-28/-22
	64-QAM	2/3	-22	-30/-24
	64-QAM	3/4	-25	-31/-26
	64-QAM	5/6	-28	-32/-28
➤	802.11na			
	Modulation	Code Rate	Relative constellation error (dB)	Relative constellation error (dB)
			IEEE Spec (1Tx dB)	Typical/Maximum (2Tx dB)
✧	HT20			
	BPSK	1/2	-5	-26/-15

	QPSK	1/2	-10	-26/-16
	QPSK	3/4	-13	-26/-16
	16-QAM	1/2	-16	-28/-20
	16-QAM	3/4	-19	-29/-22
	64-QAM	2/3	-22	-30/-24
	64-QAM	3/4	-25	-30/-26
	64-QAM	5/6	-28	-30/-28
	✧ HT40			
	BPSK	1/2	-5	-20/-15
	QPSK	1/2	-10	-20/-15
	QPSK	3/4	-13	-20/-15
	16-QAM	1/2	-16	-25/-20
	16-QAM	3/4	-19	-26/-22
	64-QAM	2/3	-22	-28/-24
	64-QAM	3/4	-25	-31/-26
	64-QAM	5/6	-28	-32/-28
Sensitivity	➤ 802.11a			
	Modulation	Code Rate	IEEE Spec (1Rx dBm)	Typical/Maximum (3Rx dBm)
	BPSK	1/2	-82	-94/-90
	BPSK	3/4	-81	-94/-90
	QPSK	1/2	-79	-94/-89
	QPSK	3/4	-77	-93/-88
	16-QAM	1/2	-74	-90/-86
	16-QAM	3/4	-70	-87/-82
	64-QAM	2/3	-66	-83/-79
	64-QAM	3/4	-65	-81/-77
	➤ 802.11b			
	Modulation		IEEE Spec (1Rx dBm)	Typical/Maximum (3Rx dBm)
	DBPSK		-82	-99/-95
	DQPSK		-80	-93/-89
	CCK		-76	-90/-86
	➤ 802.11g			
	Modulation	Code Rate	IEEE Spec (1Rx dBm)	Typical/Maximum (3Rx dBm)
	BPSK	1/2	-82	-95/-91
	BPSK	3/4	-81	-95/-91
	QPSK	1/2	-79	-95/-91
	QPSK	3/4	-77	-94/-90
	16-QAM	1/2	-74	-91/-87
	16-QAM	3/4	-70	-88/-84
	64-QAM	2/3	-66	-84/-80
	64-QAM	3/4	-65	-82/-77
	➤ 802.11ng			
	Modulation	Code Rate	IEEE Spec (1Rx dBm)	Typical/Maximum (3Rx dBm)
	✧ HT20			
	BPSK	1/2	-80	-95/-91
	QPSK	1/2	-77	-94/-90
	QPSK	3/4	-75	-91/-87
	16-QAM	1/2	-72	-88/-84
	16-QAM	3/4	-68	-85/-81
64-QAM	2/3	-64	-81/-77	

	<p>64-QAM 3/4 -63 -80/-76</p> <p>64-QAM 5/6 -62 -77/-72</p> <p>✧ HT40</p> <p>BPSK 1/2 -77 -91/-86</p> <p>QPSK 1/2 -74 -90/-86</p> <p>QPSK 3/4 -72 -88/-83</p> <p>16-QAM 1/2 -69 -85/-81</p> <p>16-QAM 3/4 -65 -82/-78</p> <p>64-QAM 2/3 -61 -78/-74</p> <p>64-QAM 3/4 -60 -77/-72</p> <p>64-QAM 5/6 -59 -74/-70</p> <p>➤ 802.11na</p> <table border="1"> <thead> <tr> <th>Modulation</th> <th>Code Rate</th> <th>IEEE Spec (1Rx dBm)</th> <th>Typical/Maximum (3Rx dBm)</th> </tr> </thead> <tbody> <tr> <td>✧ HT20</td> <td></td> <td></td> <td></td> </tr> <tr> <td>BPSK</td> <td>1/2</td> <td>-80</td> <td>-94/-90</td> </tr> <tr> <td>QPSK</td> <td>1/2</td> <td>-77</td> <td>-92/-88</td> </tr> <tr> <td>QPSK</td> <td>3/4</td> <td>-75</td> <td>-90/-86</td> </tr> <tr> <td>16-QAM</td> <td>1/2</td> <td>-72</td> <td>-87/-83</td> </tr> <tr> <td>16-QAM</td> <td>3/4</td> <td>-68</td> <td>-84/-81</td> </tr> <tr> <td>64-QAM</td> <td>2/3</td> <td>-64</td> <td>-81/-76</td> </tr> <tr> <td>64-QAM</td> <td>3/4</td> <td>-63</td> <td>-79/-75</td> </tr> <tr> <td>64-QAM</td> <td>5/6</td> <td>-62</td> <td>-76/-72</td> </tr> <tr> <td>✧ HT40</td> <td></td> <td></td> <td></td> </tr> <tr> <td>BPSK</td> <td>1/2</td> <td>-77</td> <td>-90/-86</td> </tr> <tr> <td>QPSK</td> <td>1/2</td> <td>-74</td> <td>-89/-85</td> </tr> <tr> <td>QPSK</td> <td>3/4</td> <td>-72</td> <td>-88/-84</td> </tr> <tr> <td>16-QAM</td> <td>1/2</td> <td>-69</td> <td>-85/-80</td> </tr> <tr> <td>16-QAM</td> <td>3/4</td> <td>-65</td> <td>-81/-77</td> </tr> <tr> <td>64-QAM</td> <td>2/3</td> <td>-61</td> <td>-78/-73</td> </tr> <tr> <td>64-QAM</td> <td>3/4</td> <td>-60</td> <td>-76/-72</td> </tr> <tr> <td>64-QAM</td> <td>5/6</td> <td>-59</td> <td>-74/-70</td> </tr> </tbody> </table>	Modulation	Code Rate	IEEE Spec (1Rx dBm)	Typical/Maximum (3Rx dBm)	✧ HT20				BPSK	1/2	-80	-94/-90	QPSK	1/2	-77	-92/-88	QPSK	3/4	-75	-90/-86	16-QAM	1/2	-72	-87/-83	16-QAM	3/4	-68	-84/-81	64-QAM	2/3	-64	-81/-76	64-QAM	3/4	-63	-79/-75	64-QAM	5/6	-62	-76/-72	✧ HT40				BPSK	1/2	-77	-90/-86	QPSK	1/2	-74	-89/-85	QPSK	3/4	-72	-88/-84	16-QAM	1/2	-69	-85/-80	16-QAM	3/4	-65	-81/-77	64-QAM	2/3	-61	-78/-73	64-QAM	3/4	-60	-76/-72	64-QAM	5/6	-59	-74/-70	
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Operation distance	<p>➤ 802.11a</p> <p>Outdoor: 50 m @54Mbps, 300 m @6Mbps</p> <p>Indoor: 30 m @54Mbps, 100 m @6Mbps</p> <p>➤ 802.11b</p> <p>Outdoor: 150 m @11Mbps, 300 m @1Mbps</p> <p>Indoor: 30 m @11Mbps, 100 m @1Mbps</p> <p>➤ 802.11g</p> <p>Outdoor: 50 m @54Mbps, 300 m @6Mbps</p> <p>Indoor: 30 m @54Mbps, 100 m @6Mbps</p> <p>➤ 802.11n</p> <p>Outdoor: 250 m @6.5Mbps (MCS0: 1 Nss/20MHz BW)</p> <p>30 m @130Mbps (MCS15: 2 Nss/20MHz BW)</p> <p>30 m @300Mbps (MCS15: 2 Nss/40MHz BW)</p> <p>Indoor: 100 m @6.5Mbps (MCS0: 1 Nss/20MHz BW)</p> <p>20 m @130Mbps (MCS15: 2 Nss/20MHz BW)</p> <p>20 m @300Mbps (MCS15: 2 Nss/40MHz BW)</p>	<p>Operation distance depends on real environment.</p>																																																																												
Operation System supported	➤ Windows® XP Professional , Microsoft® Windows Vista™ Business/Ultimate																																																																													
PCB	➤ 112mm(L) x 48mm(W) x 0.787mm(T) 4L FR4																																																																													

Dimension	
Security	<ul style="list-style-type: none"> ➤ 64-bit, 128-bit, 152-bit WEP Encryption ➤ 802.1x Authentication ➤ AES-CCM & TKIP Encryption
Operation mode	<ul style="list-style-type: none"> ➤ Infrastructure mode
Transfer data rate	<ul style="list-style-type: none"> ➤ 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps ➤ 802.11b: 1, 2, 5.5, 11Mbps ➤ 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps ➤ 802.11n: @800GI(400GI) <ul style="list-style-type: none"> ● 20MHz BW <ul style="list-style-type: none"> ▪ 1 Nss: 65(72.2) Mbps maximal ▪ 2 Nss: 130(144.444) Mbps maximal ● 40MHz BW <ul style="list-style-type: none"> ▪ 1 Nss: 135(150) Mbps maximal ▪ 2 Nss: 270(300) Mbps maximal
Operation temperature	➤ 0° ~ 55° C
Storage temperature	➤ -20° ~ 80° C
WHQL	➤ Microsoft® XP Professional & Microsoft® Windows Vista™ Business/Ultimate Compliant
FAA	➤ S/W audio On/Off support
Certifications	<ul style="list-style-type: none"> ➤ FCC part 15 (USA) FCC ID: RD7-C1060 ➤ IC RSS210 (Canada) IC ID: 7491A-C1060 ➤ EN301893 v1.4.1 (2007-07), EN301893 v1.4.1 (2007-02), EN300328v1.7.1 (2006-10) ➤ RoHS compliance
Media access protocol	➤ CSMA/CA with ACK architecture 32-bit MAC
Antenna	➤ Dual Band Metal PIFA Antenna x 2 and Chip Antenna x 1