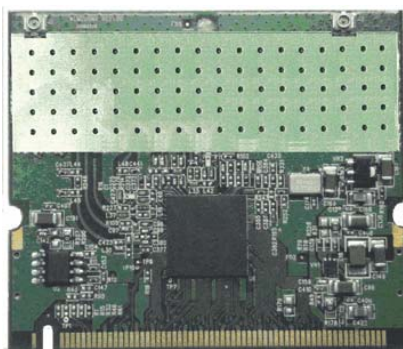


Radio module



WLM200NX MINIPCI

2 x 2 802.11N Dual-band MIMO mini-PCI

Features

- 2.4/5GHz IEEE 802.11n draft compliant and backward compatible with 802.11
- Dual-band 2x2 MIMO spatial multiplexing technique
- 5GHz band for high-end multimedia application Vs. 2.4GHz for simple data service
- Deliver 10 times the throughput and widen twice the range of legacy 802.11a/g
- Support up to 300Mbps physical data rates
- Transmission Power Control (TPC)
- Dynamic Frequency Selection (DFS)
- Multi-Country Roaming Support (IEEE802.11d)
- 2 X U.FL Antenna Connector
- Maximum 20dBm output Power
- Support Linux OS
- Wireless Encryption and Authentication are supported

Technical Specifications										
Chipset	AR9220									
Host Interface	PCI Interface v2.3 (Type III-A Mini PCI form factor)									
Operating Voltage	3.3 VDC									
Power Consumption	2.4W									
Antenna Connector	2 x U.FL Antenna Connector									
Data Rate	IEEE 802.11a :	54Mbps	48Mbps	36Mbps	24Mbps	18Mbps	12Mbps	9Mbps	6Mbps	
	IEEE 802.11b :	11Mbps	5.5Mbps	2Mbps	1Mbps					
	IEEE 802.11g :	54Mbps	48Mbps	36Mbps	24Mbps	18Mbps	12Mbps	9Mbps	6Mbps	automatically
	IEEE 802.11n :	20MHZ	Max. 65Mbps(72.2Mbps) @ MCS7:1Nss Max. 130Mbps(144.4Mbps) @MCS15:2Nss							
		40MHz	Max. 135Mbps(150Mbps) @MCS7:1Nss Max. 270Mbps(300Mbps)@MCS15:2Nss							
Frequency Range	IEEE 802.11b/g:	2.412GHz ~ 2.462GHz (US & Canada)								
		2.412GHz ~ 2.472GHz (Europe)								
		2.412GHz ~ 2.484GHz (Japan)								
	IEEE 802.11a:	5.15 ~ 5.35 GHz, 5.725 ~ 5.850 GHz (US & Canada)								
		5.15 ~ 5.35 GHz, 5.50 ~ 5.725 GHz (Europe)								
		5.03 ~ 5.091 GHz, 5.15 ~ 5.25 GHz (Japan)								
	IEEE 802.11n	2.412GHz ~ 2.462GHz(US & Canada)								
5.15 ~ 5.35 GHz, 5.50 ~ 5.725 GHz (Europe)										
5.15 ~ 5.35 GHz, 5.725 ~ 5.850 GHz (US & Canada)										
	5.03 ~ 5.091 GHz, 5.15 ~ 5.25 GHz (Japan)									
Modulation Techniques	OFDM: BPSK, QPSK, 16 QAM, 64QAM DSSS: DBPSK, DQPSK, CCK									
Security	64/128-bit WEP, TKIP, AES, IEEE802.1x authentication									
Radio & EMC Certificate	FCC Part 15.407 (5.150--5.350GHz & 5.470--5.725GHz & 5.725 ~ 5.825GHz), FCC Part 15.247 (5.725 ~ 5.850GHz), FCC Part 15.247 (2.400 ~ 2.4835GHz), FCC CFR Title 47 Part 15 Subpart C: Section 15.207 FCC CFR Title 47 Part 15 Subpart C: Section 15.209 FCC CFR Title 47 Part 15 Subpart C: 15.215(c) FCC CFR Title 47 Part 15 Subpart B: Class B ANSI C63.4 FCC OET 65 Limited module level approval. ETSI, EN 301 893, EN 302 502, EN 300 328, EN 301 489- 1/17, EN 50392, EN 55022, EN 55024, EN 61000-3-2/3, EN 61000-4-3/4/5/6/11									
ROHS Compliance	Yes									
Environment Specifications	Operating: -20°C to 70°C Storage: -20°C to 90°									
Humidity	5% to 95% (non-condensing)									
Dimension	59.6 x 51 x 3 mm									

WLM 200NX MIMO MINIPCI CARD RADIO							
TX SPECIFICATIONS				TX SPECIFICATIONS			
	DataRate	TX Power	Tolerance		DataRate	TX Power	Tolerance
802.11a	6-24Mbps	18dBm	±2dB	802.11b /g	6-24Mbps	20dBm	±2dB
	36Mbps	18dBm	±2dB		36Mbps	19.5dBm	±2dB
	48Mbps	17dBm	±2dB		48Mbps	18.5dBm	±2dB
	54Mbps	16dBm	±2dB		54Mbps	17dBm	±2dB
2.4Ghz 11n HT20	MCS 0	18dbm	±2dB	2.4Ghz 11n HT40	MCS 0	18dBm	±2dB
	MCS 1	18dbm	±2dB		MCS 1	18dBm	±2dB
	MCS 2	18dbm	±2dB		MCS 2	17.5dBm	±2dB
	MCS 3	17.5dbm	±2dB		MCS 3	17dBm	±2dB
	MCS 4	17.5dbm	±2dB		MCS 4	16.5dBm	±2dB
	MCS 5	17dbm	±2dB		MCS 5	16dBm	±2dB
	MCS 6	16dbm	±2dB		MCS 6	15.5dBm	±2dB
	MCS 7	15dbm	±2dB		MCS 7	14.5dBm	±2dB
	MCS 8	18dbm	±2dB		MCS 8	18dBm	±2dB
	MCS 9	18dbm	±2dB		MCS 9	18dBm	±2dB
	MCS 10	18dbm	±2dB		MCS 10	17.5dBm	±2dB
	MCS 11	17.5dbm	±2dB		MCS 11	17dBm	±2dB
	MCS 12	17.5dbm	±2dB		MCS 12	16.5dBm	±2dB
	MCS 13	17dbm	±2dB		MCS 13	16dBm	±2dB
	MCS 14	16dbm	±2dB		MCS 14	15.5dBm	±2dB
	MCS 15	15dbm	±2dB		MCS 15	14.5dBm	±2dB
5 Ghz 11n HT20	MCS 0	18dBm	±2dB	5 Ghz 11n HT40	MCS 0	16.5dBm	±2dB
	MCS 1	18dBm	±2dB		MCS 1	16.5dBm	±2dB
	MCS 2	17.5dBm	±2dB		MCS 2	16.5dBm	±2dB
	MCS 3	17.5dBm	±2dB		MCS 3	16.5dBm	±2dB
	MCS 4	16.5dBm	±2dB		MCS 4	16.5dBm	±2dB
	MCS 5	16dBm	±2dB		MCS 5	14.5dBm	±2dB
	MCS 6	15dBm	±2dB		MCS 6	14dBm	±2dB
	MCS 7	12dBm	±2dB		MCS 7	9dBm	±2dB
	MCS 8	18dBm	±2dB		MCS 8	16.5dBm	±2dB
	MCS 9	18dBm	±2dB		MCS 9	16.5dBm	±2dB
	MCS 10	17.5dBm	±2dB		MCS 10	16.5dBm	±2dB
	MCS 11	17.5dBm	±2dB		MCS 11	16.5dBm	±2dB
	MCS 12	16.5dBm	±2dB		MCS 12	16.5dBm	±2dB
	MCS 13	16dBm	±2dB		MCS 13	14.5dBm	±2dB
	MCS 14	15dBm	±2dB		MCS 14	14dBm	±2dB
	MCS 15	12dBm	±2dB		MCS 15	9dBm	±2dB

WLM 200NX MIMO MINIPCI CARD RADIO								
RX SPECIFICATIONS (802.11b)								
	Data Rate		Sensitivity (Maximum/Typical 2Rx)		Tolerance			
802.11b	1M		-96/-92Bm		±2dB			
	5.5M		-94/-90dBm		±2dB			
	11M		-91/-87dBm		±2dB			
RX SPECIFICATIONS(802.11a)					RX SPECIFICATIONS (802.11g)			
	Data Rate	Sensitivity (Maximum/Typical 2Rx)	Tolerance			Data Rate	Sensitivity (Maximum/Typical 2Rx)	Tolerance
802.11a	6M	-95/-91dBm	±2dB		802.11g	6M	-96/-92dBm	±2dB
	9M	-95/-91dBm	±2dB			9M	-96/-92dBm	±2dB
	12M	-95/-91dBm	±2dB			12M	-96/-92dBm	±2dB
	18M	-94/-90dBm	±2dB			18M	-95/-91dBm	±2dB
	24M	-90/-86dBm	±2dB			24M	-92/-88dBm	±2dB
	36M	-87/-83dBm	±2dB			36M	-89/-85dBm	±2dB
	48M	-83/-79dBm	±2dB			48M	-85/-81dBm	±2dB
	54M	-82/-78dBm	±2dB			54M	-83/-79dBm	±2dB
RX SPECIFICATIONS(802.11a/n)					RX SPECIFICATIONS (802.11b/g/n)			
	Data Rate	Sensitivity (Maximum/Typical 2Rx)	Tolerance			Data Rate	Sensitivity (Maximum/Typical 2Rx)	Tolerance
802.11 a/n HT20	MCS0	-95/-91dBm	±2dB		802.11 b/g/n HT20	MCS0	-96/-92dBm	±2dB
	MCS1	-94/-90dBm	±2dB			MCS1	-95/-91dBm	±2dB
	MCS2	-92/-88dBm	±2dB			MCS2	-93/-89dBm	±2dB
	MCS3	-88/-84dBm	±2dB			MCS3	-90/-86dBm	±2dB
	MCS4	-85/-81dBm	±2dB			MCS4	-87/-81dBm	±2dB
	MCS5	-81/-77dBm	±2dB			MCS5	-83/-76dBm	±2dB
	MCS6	-80/-76dBm	±2dB			MCS6	-81/-76dBm	±2dB
	MCS7	-77/-73dBm	±2dB			MCS7	-79/-73dBm	±2dB
	MCS8	-94/-90dBm	±2dB			MCS8	-95/-91dBm	±2dB
	MCS9	-92/-87dBm	±2dB			MCS9	-93/-89dBm	±2dB
	MCS10	-89/-85dBm	±2dB			MCS10	-90/-86dBm	±2dB
	MCS11	-86/-82dBm	±2dB			MCS11	-87/-83dBm	±2dB
	MCS12	-83/-79dBm	±2dB			MCS12	-84/-80dBm	±2dB
	MCS13	-78/-74dBm	±2dB			MCS13	-79/-75dBm	±2dB
	MCS14	-77/-73dBm	±2dB			MCS14	-77/-73dBm	±2dB
MCS15	-74/-69dBm	±2dB		MCS15	-75/-71dBm	±2dB		
802.11 a/n HT40	MCS0	-91/-87dBm	±2dB		802.11 b/g/n HT40	MCS0	-90/-86dBm	±2dB
	MCS1	-90/-86dBm	±2dB			MCS1	-90/-86dBm	±2dB
	MCS2	-88/-84dBm	±2dB			MCS2	-89/-85dBm	±2dB
	MCS3	-85/-81dBm	±2dB			MCS3	-87/-82dBm	±2dB
	MCS4	-82/-78dBm	±2dB			MCS4	-84/-79dBm	±2dB
	MCS5	-78/-74dBm	±2dB			MCS5	-79/-75dBm	±2dB
	MCS6	-77/-73dBm	±2dB			MCS6	-78/-74dBm	±2dB
	MCS7	-74/-70dBm	±2dB			MCS7	-75/-71dBm	±2dB
	MCS8	-91/-87dBm	±2dB			MCS8	-90/-86dBm	±2dB
	MCS9	-88/-84dBm	±2dB			MCS9	-89/-85dBm	±2dB
	MCS10	-86/-82dBm	±2dB			MCS10	-87/-83dBm	±2dB
	MCS11	-83/-79dBm	±2dB			MCS11	-84/-80dBm	±2dB
	MCS12	-80/-76dBm	±2dB			MCS12	-81/-77dBm	±2dB
	MCS13	-75/-71dBm	±2dB			MCS13	-76/-72dBm	±2dB
	MCS14	-73/-69dBm	±2dB			MCS14	-74/-68dBm	±2dB
MCS15	-70/-66dBm	±2dB		MCS15	-71/-67dBm	±2dB		

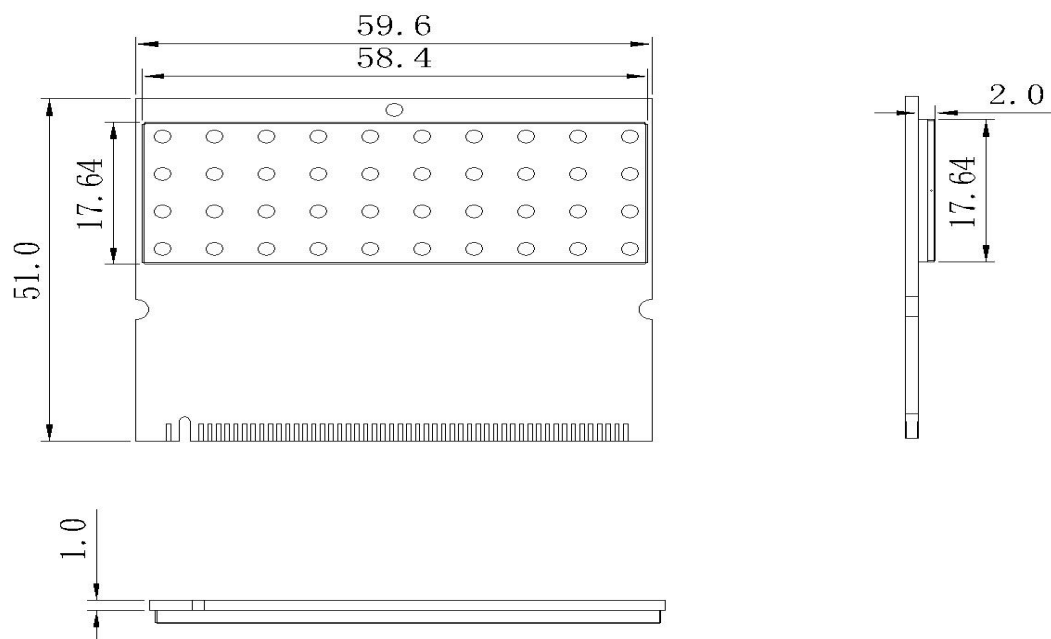
DRIVER INFORMATION	
Driver	Linux, Windows XP, Windows2000, Windows Vista

ORDERING CONFIGURATIONS^①

CODES	SPEED	Carton Dimension
WLM200NX 6AA1100	Up to 300 Mbps physical data rates	For 50pcs (pcs/ctn), 0.40m * 0.22m * 0.085m / 0.006 = 1.5KG
WLM200NX 6AA1300	Up to 300 Mbps physical data rates	For 250pc (pcs/ctn), 0.45m * 0.45m * 0.24m / 0.006 = 8.1KG

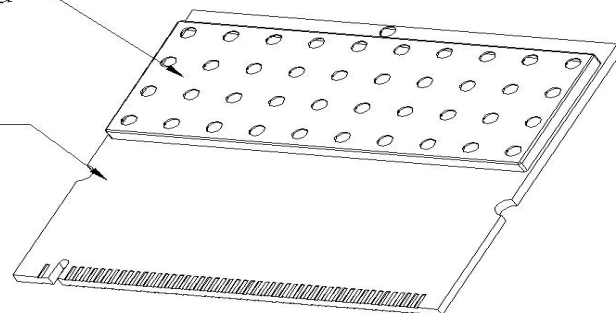
① Configurations are subjected to change without notice

DIMENSIONS DRAWING



Radiation Shield

PCB



WLM FAMILY SERIES OF MINIPCI

b / g (2.4GHz)							a / b / g (2.4/5GHz)				
MODEL	WLM 54G-20dBm	WLM 54G-23dBm	WLM 54G-26dBm	WLM 54G-28dBm	WLM200N2	WLM200N2-26dBm	WLM 54AG – 20dBm	WLM 54 AG – 23dBm	WLM 54A – 26dBm	WLM200N5-24	WLM200N5-26
CHIPSET	AR 2413/2414 (AR5005G/GS)	AR 2413/2414 (AR5005G/GS)	AR 2413/2414 (AR5005G/GS)	AR 2413/2414 (AR5005G/GS)	AR9223	AR9223	AR 5413/5414 (AR5006X/XS)	AR 5413/5414 (AR5006X/XS)	AR5414(AR5006 XS)	AR9220	AR9220
SPEED	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 300Mbps physical data rates	UP TO 300Mbps physical data rates	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 108Mbps	UP TO 300Mbps physical data rates	UP TO 300Mbps physical data rates
OUTPUT POWER (Average)											
802.11a							-	23dBm@6-24Mbps	26dBm@6-24Mbps	24dBm@6-24Mbps	26dBm@6-24Mbps
							17dBm@36Mbps	21dBm@36Mbps	24dBm@36Mbps	24dBm@36Mbps	26dBm@36Mbps
							16dBm@48Mbps	19dBm@48Mbps	22Bm@48Mbps	23Bm@48Mbps	25Bm@48Mbps
							13dBm@54Mbps	17dBm@54Mbps	20dBm@54Mbps	17dBm@54Mbps	19dBm@54Mbps
802.11b	20dBm@1-11Mbps	23dBm@1-11Mbps	26dBm@1-11Mbps	28dBm@1-11Mbps	20dBm@1-11Mbps	26dBm@1-11Mbps	20dBm@1-11Mbps	23dBm@1-11Mbps			
802.11g	20dBm@6-24Mbps	23dBm@6-24Mbps	26dBm@6-24Mbps	28dBm@6-24Mbps	20dBm@6-24Mbps	26dBm@6-24Mbps	20dBm@6-24Mbps	23dBm@6-24Mbps			
	19dBm@36Mbps	22dBm@36Mbps	25dBm@36Mbps	26dBm@36Mbps	19.5dBm@36Mbps	26dBm@36Mbps	18dBm@36Mbps	21dBm@36Mbps			
	17dBm@48Mbps	19dBm@48Mbps	24dBm@48Mbps	25dBm@48Mbps	18.5dBm@48Mbps	22dBm@48Mbps	17dBm@48Mbps	19dBm@48Mbps			
	16dBm@54Mbps	17dBm@54Mbps	22dBm@54Mbps	23dBm@54Mbps	17dBm@54Mbps	21dBm@54Mbps	15dBm@54Mbps	17dBm@54Mbps			
Interface	PCI Interface v2.3 (Type III-A/B Mini PCI Form Factor)										
Receiver Sensitivity	802.11g < -90dBm @ 6Mbps < -70dBm @ 54Mbps		802.11b < -92dBm@ 6Mbps < -87dBm @11Mbps		802.11a < -90dBm @ 6Mbps < -70dBm @ 54Mbps						
Operating Channels	IEEE 802.11g: 11 Channel (US & Canada) 13 Channel (Europe) 14 Channel (Japan)					IEEE 802.11a: 13 Channel (US & Canada) 19 Channel (Europe) 10 Channel (Japan)					
Power	3.3VDC										
Operating Temperature	-20°C to 70°C										

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