



MINIPCI RADIO CARD WLM200NX

2 x 2 802.11N 2.4/5GHz Dual-band MIMO miniPCI

Features

- Atheros MB92 reference design
- Atheros XSPAN family chipset, P/N AR9220
- 2.4/5GHz IEEE 802.11n compliant and backward compatible with 802.11a/b/g
- 2.4/5GHz Dual-band 2x2 MIMO spatial multiplexing technique
- Maximum 20dBm output (per antenna port) - 23dBm aggregate
- Supports up to 300Mbps physical data rates
- Delivers 10 times the throughput and nearly twice the range of legacy 802.11 and 802.11b/g networks
- Transmission Power Control (IEEE 802.11h TPC)
- Dynamic Frequency Selection (DFS)
- Multi-Country Roaming Supported (IEEE802.11d Global Harmonization Standard)
- 2 x U.FL Antenna Connectors

Technical Specifications											
Chipset	AR9220										
Host Interface	PCI Interface v2.3 (Type III-A Mini PCI form factor)										
Operating Voltage	3.3 VDC										
Power Consumption [T2R]	11b Cont. Tx @5.5M	2.5W									
	11g Cont. Tx @6M	2.5W									
	11a Cont. Tx @6M	2.5W									
	11ng Cont. Tx@HT20 MCS0	2.3W									
	11ng Cont. Tx@HT40 MCS0	2.3W									
	11na Cont. Tx@HT20 MCS0	2.3W									
	11na Cont. Tx@HT40 MCS0	2.3W									
	11g Cont. Rx	0.9W									
	11a Cont. Rx	0.9W									
Standby	0.7W										
Antenna Connector	2 x U.FL										
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		
	IEEE 802.11n :	20MHz	1Nss: 65Mbps @ 800GI, 72.2Mbps @ 400GI (Max.) 2Nss: 130Mbps @ 800GI, 144.4Mbps @ 400GI (Max.)								
		40MHz	1Nss: 135Mbps @ 800GI, 150Mbps @ 400GI (Max.) 2Nss: 270Mbps @ 800GI, 300Mbps @ 400GI (Max.)								
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:	5.150 ~ 5.350 GHz, 5.470 ~ 5.725GHz, 5.725 ~ 5.850 GHz (US & Canada)									
		5.150 ~ 5.350 GHz, 5.470 ~ 5.725GHz, 5.725 ~ 5.875 GHz (Europe)									
		5.150 ~ 5.250 GHz, 5.250 ~ 5.350GHz, 5.470 ~ 5.725GHz (Japan)									
	IEEE 802.11n	2.412GHz ~ 2.462GHz (US & Canada)									
		2.412GHz ~ 2.472GHz (Europe)									
		2.412GHz ~ 2.484GHz (Japan)									
		5.150 ~ 5.350 GHz, 5.470 ~ 5.725GHz, 5.725 ~ 5.850 GHz (US & Canada) 5.150 ~ 5.350 GHz, 5.470 ~ 5.725GHz, 5.725 ~ 5.875 GHz (Europe) 5.150 ~ 5.250 GHz, 5.250 ~ 5.350GHz, 5.470 ~ 5.725GHz (Japan)									
Modulation Techniques	OFDM: BPSK, QPSK, 16QAM, 64QAM DSSS: DBPSK, DQPSK, CCK										
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: -40°C to 90°C										
Humidity	5% to 95% (non-condensing)										
Dimension	59.6 x 51 x 3 mm										

WLM200NX MIMO MINIPCI CARD RADIO

TX SPECIFICATIONS

	DataRate	TX Power (per chain)	TX Power (2 chains)	Tolerance		DataRate	TX Power (per chain)	TX Power (2 chains)	Tolerance
802.11a	6-24Mbps	18dBm	21dBm	±2dB	802.11b/g	6-24Mbps	20dBm	23dBm	±2dB
	36Mbps	18dBm	21dBm	±2dB		36Mbps	19.5dBm	22.5dBm	±2dB
	48Mbps	17dBm	20dBm	±2dB		48Mbps	18.5dBm	21.5dBm	±2dB
	54Mbps	16dBm	19dBm	±2dB		54Mbps	17dBm	20dBm	±2dB
	DataRate	TX Power (per chain)	TX Power (2 chains)	Tolerance		DataRate	TX Power (per chain)	TX Power (2 chains)	Tolerance
2.4GHz 11n HT20	MCS 0/8	18dbm	21dBm	±2dB	2.4GHz 11n HT40	MCS 0/8	18dBm	21dBm	±2dB
	MCS 1/9	18dbm	21dBm	±2dB		MCS 1/9	18dBm	21dBm	±2dB
	MCS 2/10	18dbm	21dBm	±2dB		MCS 2/10	17.5dBm	20.5dBm	±2dB
	MCS 3/11	17.5dbm	20.5dBm	±2dB		MCS 3/11	17dBm	20dBm	±2dB
	MCS 4/14	17.5dbm	20.5dBm	±2dB		MCS 4/14	16.5dBm	19.5dBm	±2dB
	MCS 5/13	17dbm	20dBm	±2dB		MCS 5/13	16dBm	19dBm	±2dB
	MCS 6/14	16dbm	19dBm	±2dB		MCS 6/14	15.5dBm	18.5dBm	±2dB
	MCS 7/15	15dbm	18dBm	±2dB		MCS 7/15	14.5dBm	17.5dBm	±2dB
5GHz 11n HT20	MCS 0/8	18dBm	21dBm	±2dB	5 GHz 11n HT40	MCS 0/8	16.5dBm	19.5dBm	±2dB
	MCS 1/9	18dBm	21dBm	±2dB		MCS 1/9	16.5dBm	19.5dBm	±2dB
	MCS 2/10	17.5dBm	20.5dBm	±2dB		MCS 2/10	16.5dBm	19.5dBm	±2dB
	MCS 3/11	17.5dBm	20.5dBm	±2dB		MCS 3/11	16.5dBm	19.5dBm	±2dB
	MCS 4/14	16.5dBm	19.5dBm	±2dB		MCS 4/14	16.5dBm	19.5dBm	±2dB
	MCS 5/13	16dBm	19dBm	±2dB		MCS 5/13	14.5dBm	17.5dBm	±2dB
	MCS 6/14	15dBm	18dBm	±2dB		MCS 6/14	14dBm	17dBm	±2dB
	MCS 7/15	12dBm	15dBm	±2dB		MCS 7/15	9dBm	12dBm	±2dB
MCS 7/15	9dBm@5.825GHz	12dBm	±2dB	MCS 7/15	7dBm@5.795GHz	10dBm	±2dB		

RX SPECIFICATIONS (802.11b)

	DataRate	Sensitivity (2 chains)	Tolerance
802.11b	1M	-94dBm	±2dB
	5.5M	-94dBm	±2dB
	11M	-94dBm	±2dB

RX SPECIFICATIONS

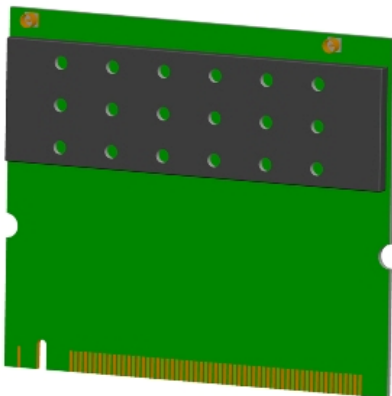
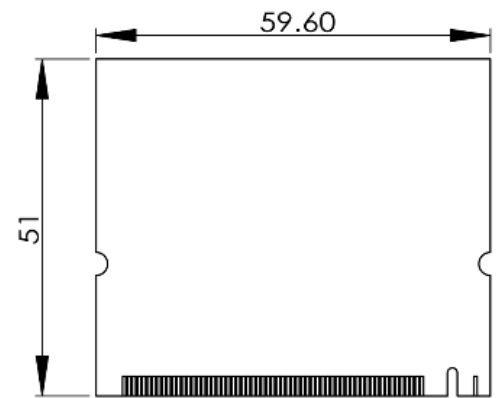
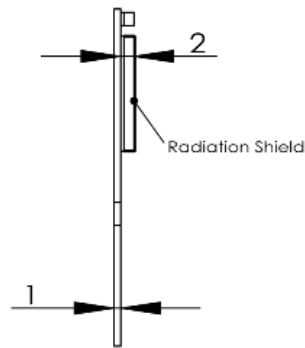
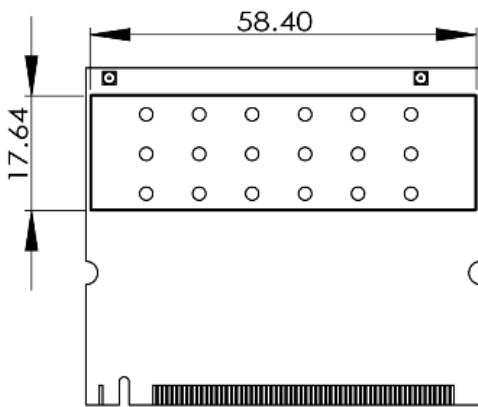
	DataRate	Sensitivity (2 chains)	Tolerance		DataRate	Sensitivity (2 chains)	Tolerance
802.11a	6M	-94dBm	±2dB	802.11g	6M	-94dBm	±2dB
	9M	-94dBm	±2dB		9M	-94dBm	±2dB
	12M	-93dBm	±2dB		12M	-93dBm	±2dB
	18M	-90dBm	±2dB		18M	-90dBm	±2dB
	24M	-86dBm	±2dB		24M	-86dBm	±2dB
	36M	-83dBm	±2dB		36M	-83dBm	±2dB
	48M	-79dBm	±2dB		48M	-80dBm	±2dB
	54M	-77dBm	±2dB		54M	-78dBm	±2dB
2.4GHz 11n HT20	MCS0	-93dBm	±2dB	2.4GHz 11n HT40	MCS0	-90dBm	±2dB
	MCS1	-92dBm	±2dB		MCS1	-89dBm	±2dB
	MCS2	-90dBm	±2dB		MCS2	-87dBm	±2dB
	MCS3	-86dBm	±2dB		MCS3	-84dBm	±2dB
	MCS4	-83dBm	±2dB		MCS4	-80dBm	±2dB
	MCS5	-78dBm	±2dB		MCS5	-76dBm	±2dB
	MCS6	-77dBm	±2dB		MCS6	-74dBm	±2dB
MCS7	-74dBm	±2dB	MCS7	-72dBm	±2dB		
5 GHz 11n HT20	MCS0	-93dBm	±2dB	5 GHz 11n HT40	MCS0	-90dBm	±2dB
	MCS1	-91dBm	±2dB		MCS1	-88dBm	±2dB
	MCS2	-87dBm	±2dB		MCS2	-85dBm	±2dB
	MCS3	-85dBm	±2dB		MCS3	-82dBm	±2dB
	MCS4	-82dBm	±2dB		MCS4	-80dBm	±2dB
	MCS5	-78dBm	±2dB		MCS5	-76dBm	±2dB
	MCS6	-77dBm	±2dB		MCS6	-74dBm	±2dB
MCS7	-74dBm	±2dB	MCS7	-72dBm	±2dB		

Ordering Information ^①

CODES	SPEED	Carton Dimension
WLM200NX 6AA1100	Up to 300Mbps physical data rates	For 50pcs (pcs/ctn), 0.40m * 0.22m * 0.085m / 0.006 = 1.5KG
WLM200NX 6AA1300	Up to 300Mbps 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,
Please contact Comexp sales representatives for other available configurations

Dimensions Drawing



WLM SERIES MINI PCI

WLM54 series miniPCI (legacy a/b/g card)								
MODEL	WLM 54G-20dBm	WLM 54G-23dBm	WLM 54G-23 ESD	WLM 54G-26dBm	WLM54G-30 ESD	WLM 54AG - 20dBm	WLM 54AG - 23dBm	WLM 54A - 26 ESD
CHIPSET	AR 2413/2414 (AR5005G/GS)	AR 2413/2414 (AR5005G/GS)	AR 2413/2414 (AR5005G/GS)	AR 2413/2414 (AR5005G/GS)	AR 2413/2414 (AR5005G/GS)	AR 5413/5414 (AR5006X/XS)	AR 5413/5414 (AR5006X/XS)	AR5414 (AR5006XS)
SPEED	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 54/108Mbps	UP TO 108Mbps
OUTPUT POWER						20dBm@6-24Mbps	23dBm@6-24Mbps	26dBm@6-24Mbps
802.11a						17dBm@36Mbps	21dBm@36Mbps	24dBm@36Mbps
						16dBm@48Mbps	19dBm@48Mbps	22Bm@48Mbps
						13dBm@54Mbps	17dBm@54Mbps	20dBm@54Mbps
802.11b	20dBm@1-11Mbps	23dBm@1-11Mbps	23dBm@1-11Mbps	26dBm@1-11Mbps	30Bm@1-11Mbps	20dBm@1-11Mbps	23dBm@1-11Mbps	-
	20dBm@6-24Mbps	23dBm@6-24Mbps	23dBm@6-24Mbps	26dBm@6-24Mbps	30dBm@6-24Mbps	20dBm@6-24Mbps	23dBm@6-24Mbps	-
802.11g	19dBm@36Mbps	22dBm@36Mbps	22dBm@36Mbps	25dBm@36Mbps	28dBm@36Mbps	18dBm@36Mbps	21dBm@36Mbps	-
	17dBm@48Mbps	19dBm@48Mbps	19dBm@48Mbps	24dBm@48Mbps	27dBm@48Mbps	17dBm@48Mbps	19dBm@48Mbps	-
	16dBm@54Mbps	17dBm@54Mbps	17dBm@54Mbps	23dBm@54Mbps	25dBm@54Mbps	15dBm@54Mbps	17dBm@54Mbps	-
Receiver Sensitivity								
802.11a						-93dBm @ 6Mbps	-93dBm @ 6Mbps	-96dBm @ 6Mbps
						-72dBm @ 54Mbps	-72dBm @ 54Mbps	-76dBm @ 54Mbps
802.11b	-96dBm @ 6Mbps	-96dBm @ 6Mbps	-93dBm @ 6Mbps	-93dBm @ 6Mbps	-96dBm @ 6Mbps	-96dBm @ 6Mbps	-96dBm @ 6Mbps	-96dBm @ 6Mbps
	-90dBm @ 11Mbps	-90dBm @ 11Mbps	-90dBm @ 11Mbps	-90dBm @ 11Mbps	-90dBm @ 11Mbps	-90dBm @ 11Mbps	-90dBm @ 11Mbps	-90dBm @ 11Mbps
802.11g	-93dBm @ 6Mbps	-93dBm @ 6Mbps	-93dBm @ 6Mbps	-93dBm @ 6Mbps	-93dBm @ 6Mbps	-93dBm @ 6Mbps	-93dBm @ 6Mbps	-93dBm @ 6Mbps
	-74dBm @ 54Mbps	-74dBm @ 54Mbps	<-72dBm @ 54Mbps	<-72dBm @ 54Mbps	-74dBm @ 54Mbps	-96dBm @ 6Mbps	-96dBm @ 6Mbps	-96dBm @ 6Mbps
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)		
Interface	PCI Interface v2.3 (Type III-B Mini PCI Form Factor)							
Input Power	3.3V DC							
Operating Temperature	-20°C to 70°C							

WLM200 series miniPCI (11n MIMO 2*2 card)					
MODEL	WLM200N2	WLM200N2-26dBm	WLM200NX	WLM200N5-23 ESD	WLM200N5-26 ESD
CHIPSET	AR9223	AR9223	AR9220	AR9220	AR9220
SPEED	UP TO 300Mbps physical data rates	UP TO 300Mbps physical data rates	UP TO 300Mbps physical data rates	UP TO 300Mbps physical data rates	UP TO 300Mbps physical data rates
OUTPUT POWER					
802.11a			18dBm@6-24Mbps	23dBm@6-24Mbps	26dBm@6-24Mbps
			18dBm@36Mbps	22dBm@36Mbps	25dBm@36Mbps
			17dBm@48Mbps	21dBm@48Mbps	24dBm@48Mbps
			16dBm@54Mbps	20dBm@54Mbps	23dBm@54Mbps
5G HT20			18dBm @MCS0	23dBm @MCS0	25dBm @MCS0
			12dBm @MCS7	17dBm @MCS7	20dBm @MCS7
5G HT40			16.5dBm @MCS0	21dBm @MCS0	24dBm @MCS0
			9dBm @MCS7	14dBm @MCS7	17dBm @MCS7
802.11b	20dBm@1-11Mbps	26dBm@1-11Mbps	20dBm@1-11Mbps	20dBm@1-11Mbps	20dBm@1-11Mbps
	20dBm@6-24Mbps	26dBm@6-24Mbps	20dBm@6-24Mbps	20dBm@6-24Mbps	20dBm@6-24Mbps
802.11g	20dBm@36Mbps	26dBm@36Mbps	19.5dBm@36Mbps	19.5dBm@36Mbps	19.5dBm@36Mbps
	16dBm@48Mbps	22dBm@48Mbps	18.5dBm@48Mbps	18.5dBm@48Mbps	18.5dBm@48Mbps
	15dBm@54Mbps	21dBm@54Mbps	17dBm@54Mbps	17dBm@54Mbps	17dBm@54Mbps
2.4G HT20	17dBm @MCS0	23dBm @MCS0	18dBm @MCS0	18dBm @MCS0	18dBm @MCS0
	14dBm @MCS7	20dBm @MCS7	15dBm @MCS7	15dBm @MCS7	15dBm @MCS7
2.4G HT40	16dBm @MCS0	22dBm @MCS0	18dBm @MCS0	18dBm @MCS0	18dBm @MCS0
	14dBm @MCS7	20dBm @MCS7	14.5dBm @MCS7	14.5dBm @MCS7	14.5dBm @MCS7
Receiver Sensitivity					
802.11a			-94dBm@6M	-97dBm@6M	-96dBm@6M
			-77dBm@54M	-80dBm@54M	-79dBm@54M
5G HT20			-93dBm@MCS0	-97dBm@MCS0	-95dBm@MCS0
			-74dBm@MCS7	-77dBm@MCS7	-75dBm@MCS7
5G HT40			-90dBm@MCS0	-92dBm@MCS0	-92dBm@MCS0
			-72dBm@MCS7	-74dBm@MCS7	-74dBm@MCS7
802.11b	-94dBm@1M	-94dBm@1M	-94dBm@1M	-94dBm@1M	-94dBm@1M
	-92dBm@11M	-92dBm@11M	-94dBm@11M	-94dBm@11M	-94dBm@11M
802.11g	-94dBm@6M	-94dBm@6M	-94dBm@6M	-94dBm@6M	-94dBm@6M
	-78dBm@54M	-74dBm@54M	-78dBm@54M	-78dBm@54M	-78dBm@54M
2.4G HT20	-93dBm@MCS0	-92dBm@MCS0	-93dBm@MCS0	-93dBm@MCS0	-93dBm@MCS0
	-76dBm@MCS7	-73dBm@MCS7	-74dBm@MCS7	-74dBm@MCS7	-74dBm@MCS7
2.4G HT40	-90dBm@MCS0	-90dBm@MCS0	-90dBm@MCS0	-90dBm@MCS0	-90dBm@MCS0
	-73dBm@MCS7	-71dBm@MCS7	-72dBm@MCS7	-72dBm@MCS7	-72dBm@MCS7
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)	
Interface	PCI Interface v2.3 (Type III-A Mini PCI form factor)				
Input Power	3.3V DC				
Operating Temperature	-20°C to 70°C				

Compex Systems Pte Ltd

135 Joo Seng Road, PM Industrial Building #08-01,
Singapore 368363
Tel: (65) 6286 2086
Fax: (65) 6280-9947
Email: sales@compex.com.sg

Compex (Suzhou) Co Ltd

NO.12, ChuangTou Industrial Square,
LouFeng North, Suzhou Industrial Park,
Suzhou, Jiangsu Province, China 215122
Tel: (86)-512-62950050
Fax: (86)-512-62950026



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