



Radio module

WLM200N5-23 ESD MINIPCI

Single-Band 5GHz 802.11n MIMO 2 x 2 miniPCI

Features

- Atheros XSPAN family chipset
- 5GHz IEEE 802.11n compliant and backward compatible with 802.11a
- Maximum 23dBm output power(per chain)/ 26dBm(aggregate)
- Built-in ESD Protection with ESD/EMP Immunity Threshold: 15KeV^①
- Enhanced noise immunity and sensitivity
- Delivers 10 times the throughput and nearly twice the range of legacy 802.11a network
- Transmission Power Control (IEEE 802.11h TPC)
- Dynamic Frequency Selection (DFS)
- Multi-Country Roaming Supported (IEEE802.11d Global Harmonization Standard)
- 2 x MMCX or 2 x U.FL antenna connectors variants^②
- Cost-effective and flexible for outdoor broadband wireless applications

Technical Specifications										
Chipset	Atheros AR9220									
Host Interface	PCI Interface v2.3 (Type III-A Mini PCI form factor)									
Operating Voltage	3.3 VDC									
Power Consumption	11a Cont. Tx @6M			3.5W						
	11na Cont. Tx@HT20 MCS0			3W						
	11na Cont. Tx@HT40 MCS0			3W						
	11a Cont. Rx			0.9W						
	Standby			0.7W						
Antenna Connector	2 x MMCX or 2 x U.FL ^②									
Data Rate	IEEE 802.11a :	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.)							
Frequency Range	IEEE 802.11a/n:	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, 16-QAM, 64-QAM									
Radio & EMC Certification	CE, FCC									
RoHS Compliance	Yes									
Temperature Range	Operating: -20°C to 70°C Storage: -40°C to 90°C									
Humidity	Operating:5% to 95% (non-condensing) Storage: Max.90% (non-condensing)									
Dimensions	59.6mm x 51.5mm x 6mm (H x W x D)									

WLM200N5-23 ESD MIMO MINIPCI CARD RADIO										
TX SPECIFICATIONS										
		DataRate	TX Power (per chain)				TX Power (2 chains)		Tolerance	
802.11a		6-24Mbps	23dBm				26dBm		±2dB	
		36Mbps	21dBm				24dBm		±2dB	
		48Mbps	20dBm				23dBm		±2dB	
		54Mbps	18dBm				21dBm		±2dB	
	DataRate	TX Power (per chain)	TX Power (2 chains)	Tolerance			DataRate	TX Power (per chain)	TX Power (2 chains)	Tolerance
5GHz 11n HT 20	MCS 0/8	23dBm	26dBm	±2dB		5GHz 11n HT 40	MCS 0/8	21dBm	24dBm	±2dB
	MCS 1/9	22dBm	25dBm	±2dB			MCS 1/9	21dBm	24dBm	±2dB
	MCS 2/10	20.5dBm	23.5dBm	±2dB			MCS 2/10	19.5dBm	22.5dBm	±2dB
	MCS 3/11	20.5dBm	23.5dBm	±2dB			MCS 3/11	19.5dBm	22.5dBm	±2dB
	MCS 4/12	19.5dBm	22.5dBm	±2dB			MCS 4/12	19dBm	22dBm	±2dB
	MCS 5/13	19dBm	22dBm	±2dB			MCS 5/13	17.5dBm	20.5dBm	±2dB
	MCS 6/14	18dBm	21dBm	±2dB			MCS 6/14	17.5dBm	20.5dBm	±2dB
	MCS 7/15	17dBm	20dBm	±2dB			MCS 7/15	14dBm	17dBm	±2dB
RX SPECIFICATIONS										
	Data Rate	Sensitivity (2 chains)		Tolerance			DataRate	Sensitivity (2 chains)		Tolerance
802.11a	6M	-97dBm		±2dB		802.11a	24M	-90dBm		±2dB
	9M	-97dBm		±2dB			36M	-87dBm		±2dB
	12M	-96dBm		±2dB			48M	-83dBm		±2dB
	18M	-94dBm		±2dB			54M	-80dBm		±2dB
5GHz 11n HT 20	MCS0	-97dBm		±2dB		5GHz 11n HT 40	MCS0	-92dBm		±2dB
	MCS1	-94dBm		±2dB			MCS1	-90dBm		±2dB
	MCS2	-92dBm		±2dB			MCS2	-87dBm		±2dB
	MCS3	-87dBm		±2dB			MCS3	-84dBm		±2dB
	MCS4	-84dBm		±2dB			MCS4	-82dBm		±2dB
	MCS5	-80dBm		±2dB			MCS5	-78dBm		±2dB
	MCS6	-79dBm		±2dB			MCS6	-76dBm		±2dB
	MCS7	-77dBm		±2dB			MCS7	-74dBm		±2dB

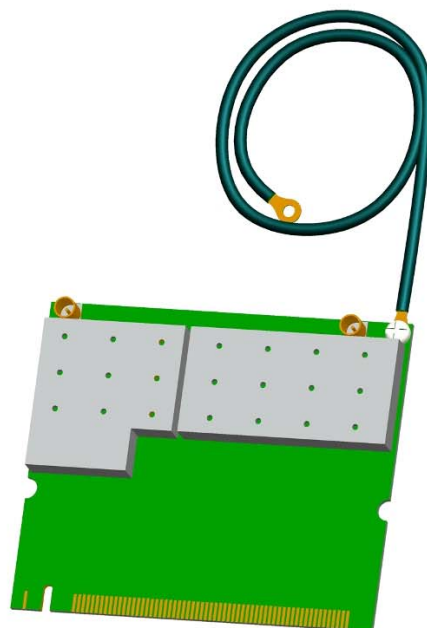
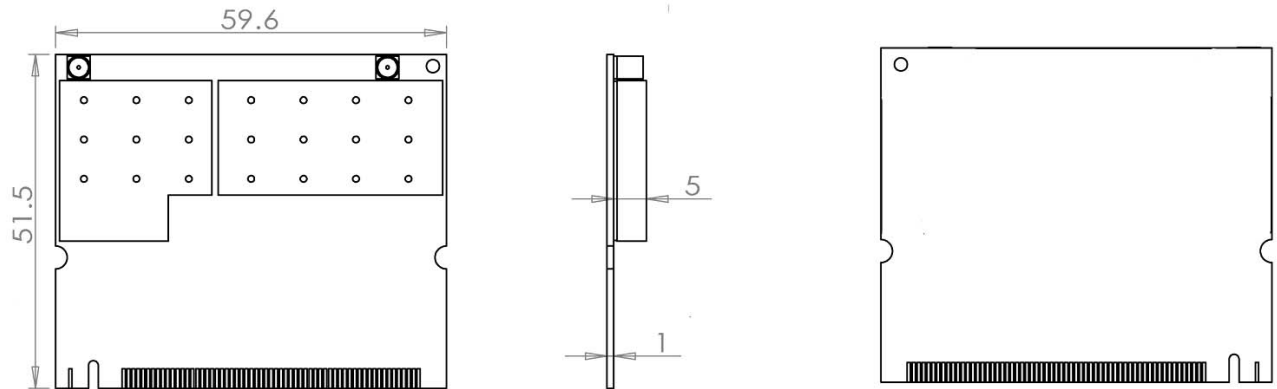
ESD CABLE SPECIFICATION	
Cable Dimensions	26cm length
Terminal Material	Copper
Attachment Procedure	End of ESD cable tied to Earth Ground

Ordering Information^③

CODES	Antenna Connectors type	Carton Dimension
WLM200N5-23 6AA1300ESD	U.FL	For 50pcs (pcs/ctn), 0.40m * 0.22m * 0.085m / 0.006 = 1.5KG For 250pc (pcs/ctn), 0.45m * 0.45m * 0.24m / 0.006 = 8.1KG
WLM200N5-23 6BA1300ESD	MMCX	

- ① Module grounding cable included
- ② Depends on your ordering configuration
- ③ Configurations are subject to change without notice

Dimensions Drawing



WLM SERIES MINIPCI

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 17dBm@36Mbps 16dBm@48Mbps 13dBm@54Mbps	23dBm@6-24Mbps 21dBm@36Mbps 19dBm@48Mbps 17dBm@54Mbps	26dBm@6-24Mbps 24dBm@36Mbps 22Bm@48Mbps 20dBm@54Mbps
802.11a								
802.11b	20dBm@1-11Mbps 20dBm@6-24Mbps	23dBm@1-11Mbps 23dBm@6-24Mbps	23dBm@1-11Mbps 23dBm@6-24Mbps	26dBm@1-11Mbps 26dBm@6-24Mbps	30Bm@1-11Mbps 30dBm@6-24Mbps	20dBm@1-11Mbps 20dBm@6-24Mbps	23dBm@1-11Mbps 23dBm@6-24Mbps	- -
802.11g	19dBm@36Mbps 17dBm@48Mbps 16dBm@54Mbps	22dBm@36Mbps 19dBm@48Mbps 17dBm@54Mbps	22dBm@36Mbps 19dBm@48Mbps 17dBm@54Mbps	25dBm@36Mbps 24dBm@48Mbps 23dBm@54Mbps	28dBm@36Mbps 27dBm@48Mbps 25dBm@54Mbps	18dBm@36Mbps 17dBm@48Mbps 15dBm@54Mbps	21dBm@36Mbps 19dBm@48Mbps 17dBm@54Mbps	- - -
Receiver Sensitivity						-93dBm @ 6Mbps -72dBm @ 54Mbps	-93dBm @ 6Mbps -72dBm @ 54Mbps	-96dBm @ 6Mbps -76dBm @ 54Mbps
802.11a								
802.11b	-96dBm@ 6Mbps -90dBm@11Mbps -93dBm @ 6Mbps	-96dBm@ 6Mbps -90dBm@11Mbps -93dBm @ 6Mbps	-93dBm@ 6Mbps -90dBm @11Mbps -93dBm @ 6Mbps	-93dBm@ 6Mbps -90dBm @11Mbps -93dBm @ 6Mbps	-96dBm@ 6Mbps -90dBm @11Mbps -93dBm @ 6Mbps	-96dBm@ 6Mbps -90dBm @11Mbps -93dBm @ 6Mbps	-96dBm@ 6Mbps -90dBm @11Mbps -93dBm @ 6Mbps	-96dBm@ 6Mbps -90dBm @11Mbps -93dBm @ 6Mbps
802.11g	-74dBm @ 54Mbps	-74dBm @ 54Mbps	<-72dBm @ 54Mbps	<-72dBm @ 54Mbps	-74dBm @ 54Mbps	-96Bm@ 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							
	32-bit mini-PCI Type III(A)+ 1.85mm longer than IIIA type							

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 18dBm@36Mbps 17dBm@48Mbps 16dBm@54Mbps	23dBm@6-24Mbps 22dBm@36Mbps 21dBm@48Mbps 20dBm@54Mbps	26dBm@6-24Mbps 25dBm@36Mbps 24dBm@48Mbps 23dBm@54Mbps
5G HT20			18dBm @MCS0 12dBm @MCS7	23dBm @MCS0 17dBm @MCS7	25dBm @MCS0 20dBm @MCS7
5G HT40			16.5dBm @MCS0 9dBm @MCS7	21dBm @MCS0 14dBm @MCS7	24dBm @MCS0 17dBm @MCS7
802.11b	20dBm@1-11Mbps 20dBm@6-24Mbps	26dBm@1-11Mbps 26dBm@6-24Mbps	20dBm@1-11Mbps 20dBm@6-24Mbps	20dBm@1-11Mbps 20dBm@6-24Mbps	20dBm@1-11Mbps 20dBm@6-24Mbps
802.11g	20dBm@36Mbps 16dBm@48Mbps 15dBm@54Mbps	22dBm@36Mbps 22dBm@48Mbps 21dBm@54Mbps	19.5dBm@36Mbps 18.5dBm@48Mbps 17dBm@54Mbps	19.5dBm@36Mbps 18.5dBm@48Mbps 17dBm@54Mbps	19.5dBm@36Mbps 18.5dBm@48Mbps 17dBm@54Mbps
2.4G HT20	17dBm @MCS0 14dBm @MCS7	23dBm @MCS0 20dBm @MCS7	18dBm @MCS0 15dBm @MCS7	18dBm @MCS0 15dBm @MCS7	18dBm @MCS0 15dBm @MCS7
2.4G HT40	16dBm @MCS0 14dBm @MCS7	22dBm @MCS0 20dBm @MCS7	18dBm @MCS0 14.5dBm @MCS7	18dBm @MCS0 14.5dBm @MCS7	18dBm @MCS0 14.5dBm @MCS7
Receiver Sensitivity					
802.11a			-94dBm@6M -77dBm@54M	-97dBm@6M -80dBm@54M	-96dBm@6M -79dBm@54M
5G HT20			-93dBm@MCS0 -74dBm@MCS7	-97dBm@MCS0 -77dBm@MCS7	-95dBm@MCS0 -75dBm@MCS7
5G HT40			-90dBm@MCS0 -72dBm@MCS7	-92dBm@MCS0 -74dBm@MCS7	-92dBm@MCS0 -74dBm@MCS7
802.11b	-94dBm@1M -92dBm@11M	-94dBm@1M -92dBm@11M	-94dBm@1M -94dBm@11M	-94dBm@1M -94dBm@11M	-94dBm@1M -94dBm@11M
802.11g	-94dBm@6M -78dBm@54M	-94dBm@6M -74dBm@54M	-94dBm@6M -78dBm@54M	-94dBm@6M -78dBm@54M	-94dBm@6M -78dBm@54M
2.4G HT20	-93dBm@MCS0 -76dBm@MCS7	-92dBm@MCS0 -73dBm@MCS7	-93dBm@MCS0 -74dBm@MCS7	-93dBm@MCS0 -74dBm@MCS7	-93dBm@MCS0 -74dBm@MCS7
2.4G HT40	-90dBm@MCS0 -73dBm@MCS7	-90dBm@MCS0 -71dBm@MCS7	-90dBm@MCS0 -72dBm@MCS7	-90dBm@MCS0 -72dBm@MCS7	-90dBm@MCS0 -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)				32-bit mini-PCI Type II/A+ (6.55mm longer than II/A type)
Input Power	3.3V DC				
Operating Temperature	-20°C to 70°C				

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