



## **nM1-420**

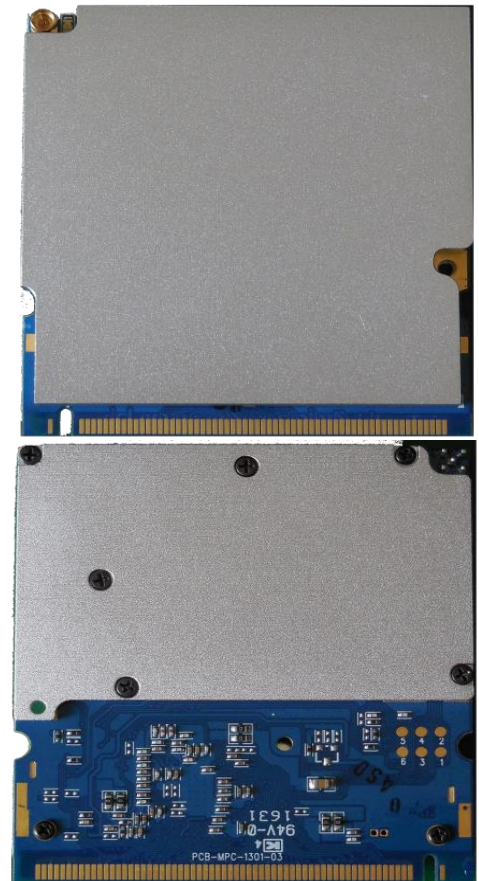
### **1x1 IEEE 802.11 b/g/n High Power Mini PCI Radio Module**

**nM1-420** is an IEEE 802.11b/g/n 420 MHz to 450 MHz Radio Module built over Vizmonet's innovative Built-to-Customize™ platform engineered for carrier class long range high data capacity applications.

With superior TX power efficient RF design, the product supports high TX Power offering best-in class EVM performance at higher modulation schemes. This facilitates to achieve long range without compromising data throughput.

With well-engineered RX Design, nM1-420 offers ultra-low receive sensitivity to achieve long range.

Backed by military grade technology, the product is ideal for deployment in harsh outdoor environment and available with plenty of options for customization to enable easy integration into OEM systems.



## **FEATURES**

- IEEE 802.11b/g/n standards compliant operating in the frequency range 420 MHz to 450 MHz
- High TX Power of up to +29 dBm for lower data rates
- Atheros AR9223-AC1A Chipset
- Mini PCI Type IIIA form factor 59.6 mm (L) x 65 mm (W)
- Support for Customization for OEM integration
- Operating Temperature range (-20 deg C to +70 deg C)

**TECHNICAL SPECIFICATION****RADIO MODULE – GENERAL INFO**

Chipset Info	Atheros AR9223-AC1A
Operating Frequency	420 MHz to 450 MHz
Security	WPA,WPA2, 802.11i with AES-CCM & TKIP Encryption, 802.1x, 64/128/152bit WEP
Data Rates	1Mbps to 11 Mbps -11b, 6Mbps to 54Mbps-11g, MCS0 to MCS7 - 11n
Channel Bandwidth	5 MHz/10 MHz/20 MHz
RoHS Compliance	Compliant
Operating System Support	Linux Open WRT and Ath9K driver

**INTERFACE SPECIFICATIONS**

Interface	PCI 32 bit,33 MHz, mini PCI Form Factor
Operating Voltage	3.3V
RF Antenna connector	Single MMCX, Vertical

**PHYSICAL SPECIFICATIONS**

Mechanical Dimension (Assembled condition)	59.6 mm (L) x 65 mm (W) x 9.5 mm (H)
Weight of the module without ESD Bag	41 g
Weight of the Module with ESD Bag	43 g

**CUSTOM FEATURES**

MAC ID	74-E2-77-00 series
PCI Sub Vendor ID	168C
PCI Sub Device ID	1307
TX Power offset	10 dB
Frequency offset	TBD
LABELS	MAC Label x1 pc on the Radio Module Model Label x pc with dual barcode on the ESD bag

**REGULATORY INFORMATION**

Regulatory Approvals	TBD
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**PACKAGING INFORMATION**

100 Units per Carton Box	520 mm (L) x 240 mm (W) x 133 mm (H)
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**ORDERING INFORMATION**

nM1-420	Mini PCI Radio Module, 1x1 IEEE 802.11 b/g/n, 420 MHz, 29 dBm
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**RADIO SPECIFICATION – RX**

Receiver Maximum input level (10% PER)	> -10 dBm
Receive Chain Noise Figure	5.5 dB
Frequency Accuracy	Within $\pm$ 15 PPM
Receiver Adjacent Channel Rejection (ACR) 10 to 20 MHz, 10% PER	6 Mbps > 30 dB HT20 MCS0,MCS8 > 30 dB HT40 MCS0,MCS8 > 20 dB
Receiver Alternate Channel Rejection (ALCR) 20 to 30 MHz, 10% PER	6 Mbps > 40 dB HT20 MCS0,MCS8 > 40 dB HT40 MCS0,MCS8 > 35 dB

**RADIO SPECIFICATION - TX**

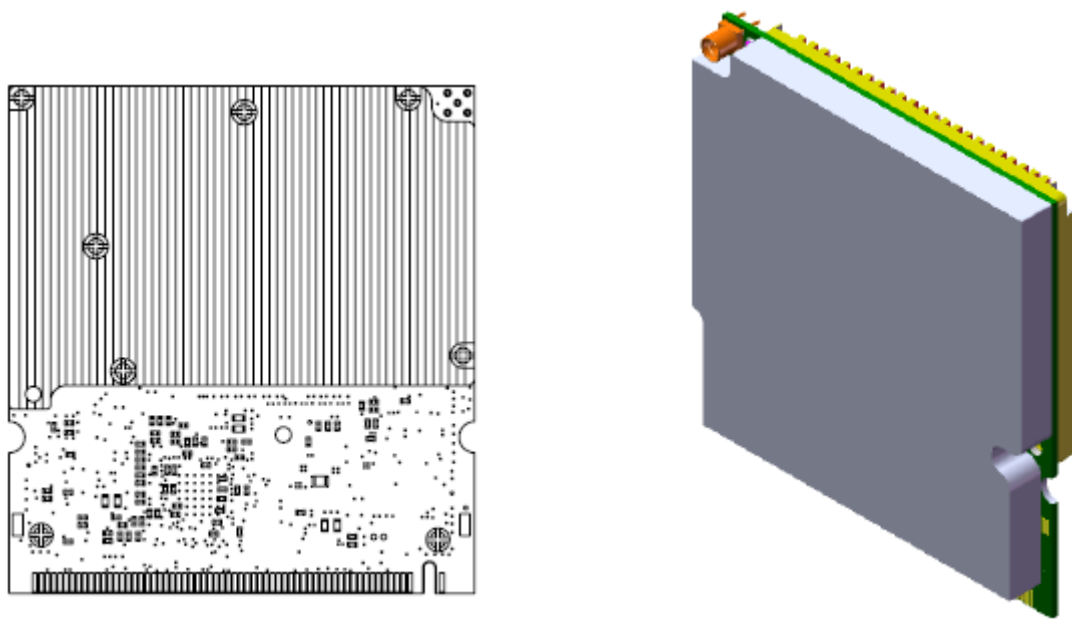
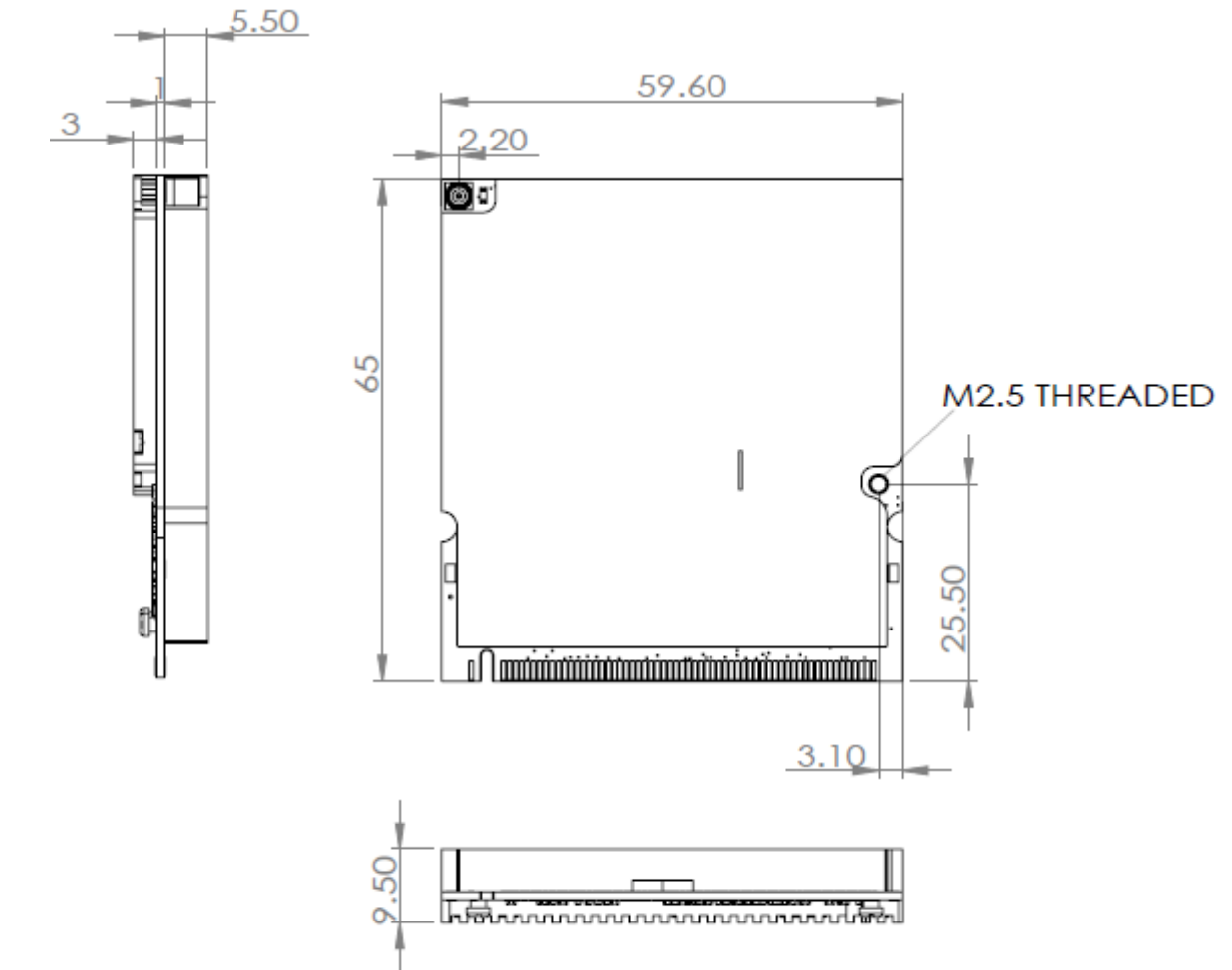
Transmit Spectral mask 11 MHz/20 MHz/30MHz Offset	> -20 dBr/> -28 dBr/> -40 dBr
RF Power control Step	0.5 dBm
Second Harmonic Spurious Emission	-30 dB
Third Harmonic Spurious Emission	-40 dB
Transmitter Spurious Emission	TBD

**RADIO SPECIFICATION – TX/RX**

RADIO TX/RX PERFORMANCE, 20 MHz BW						
	DATA RATE	MODULATION	TX POWER $\pm$ 1 dBm	TX CURRENT (A) AT 3.3V $\pm$ 0.1A	RX SENSITIVITY $\pm$ 2 dBm	RX CURRENT(A) AT 3.3V $\pm$ 0.1A
11 g	6 Mbps	BPSK	29	1.3	-92	0.15
	9 Mbps	BPSK	29	1.3	-91	0.15
	12 Mbps	QPSK	29	1.3	-91	0.15
	18 Mbps	QPSK	29	1.3	-88	0.15
	24 Mbps	16QAM	29	1.3	-84	0.15
	36 Mbps	16QAM	27	1.2	-81	0.15
	48 Mbps	64QAM	25	1.1	-75	0.15
11 b	54 Mbps	64QAM	24	1.1	-72	0.15
	1 Mbps	BPSK	30	1.3	-95	0.15
	2 Mbps	QPSK	30	1.3	-93	0.15
	5.5 Mbps	CCK	30	1.3	-91	0.15
11 n HT20	11 Mbps	CCK	30	1.3	-90	0.15
	MCS0/8	BPSK	29	1.3	-91	0.15
	MCS1/9	QPSK	29	1.3	-90	0.15
	MCS2/10	QPSK	29	1.3	-87	0.15
	MCS3/11	16QAM	29	1.3	-83	0.15
	MCS4/12	16QAM	27	1.2	-80	0.15
	MCS5/13	64QAM	24	1.1	-73	0.15
MCS6/14	64QAM	22	0.9	-72	0.15	
MCS7/15	64QAM	21	0.9	-71	0.15	

For RX Sensitivity for 40 MHz Channel BW, Add +3 dB to 20 MHz BW  
 For RX Sensitivity for 10 MHz Channel BW, Add -3 dB to 20 MHz BW  
 For RX Sensitivity for 5 MHz Channel BW, Add -6 dB to 20 MHz BW

**MECHANICAL DIMENSIONS**



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