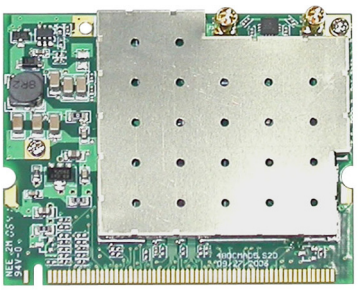
Industrial grade, high power 802.11 a/b/g wifi mini-PCI module, AR5414A-B2B

Model: CM10-HI (MMCX)



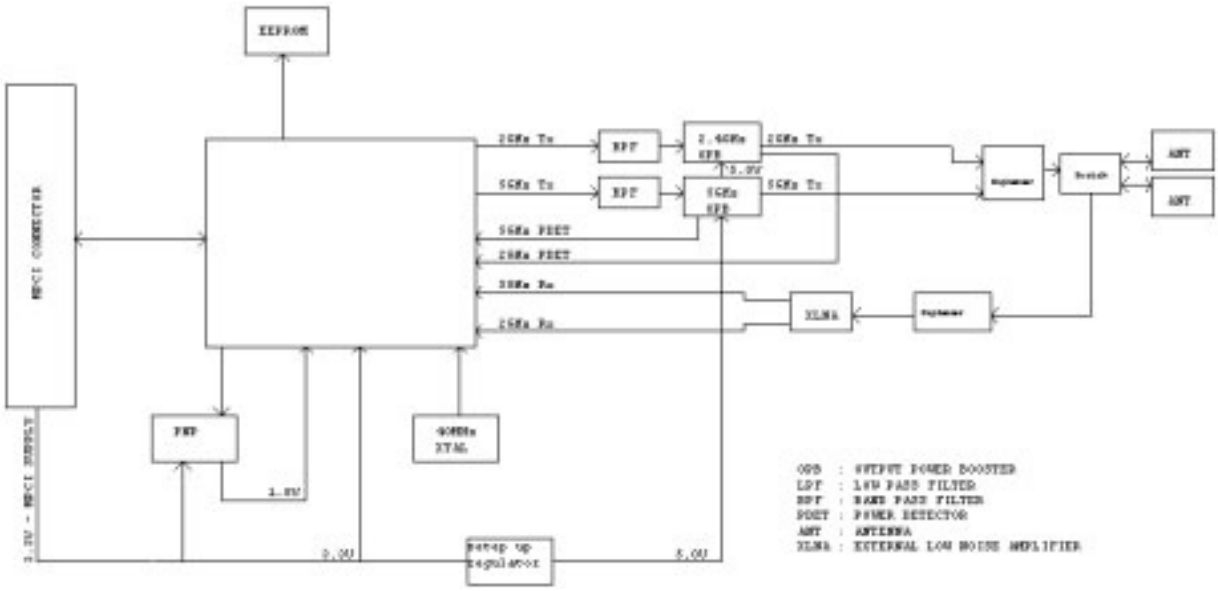
CM10-HI (MMCX) is an industrial grade high power 600mW(28dBm) IEEE802.11a/b/g 108Mbps wifi mini-PCI module with two MMCX RF connectors designed specifically for integration in high temperature durability and high performance-critical applications. Industrial grade components and high power design, CM10-HI (MMCX) is ideal for embedding into new or existing industrial grade devices such as rugged notebooks, rugged outdoor point to point or building to building wireless Access Point/Bridge connections, and rugged application-specific devices (ASDs) used in vertical market.

Optional WinCE 4.2/5.0 drivers enable ASD manufacturers to provide products that enjoy improved innovation and time to market through trouble-free WiFi integration.

Key Features:

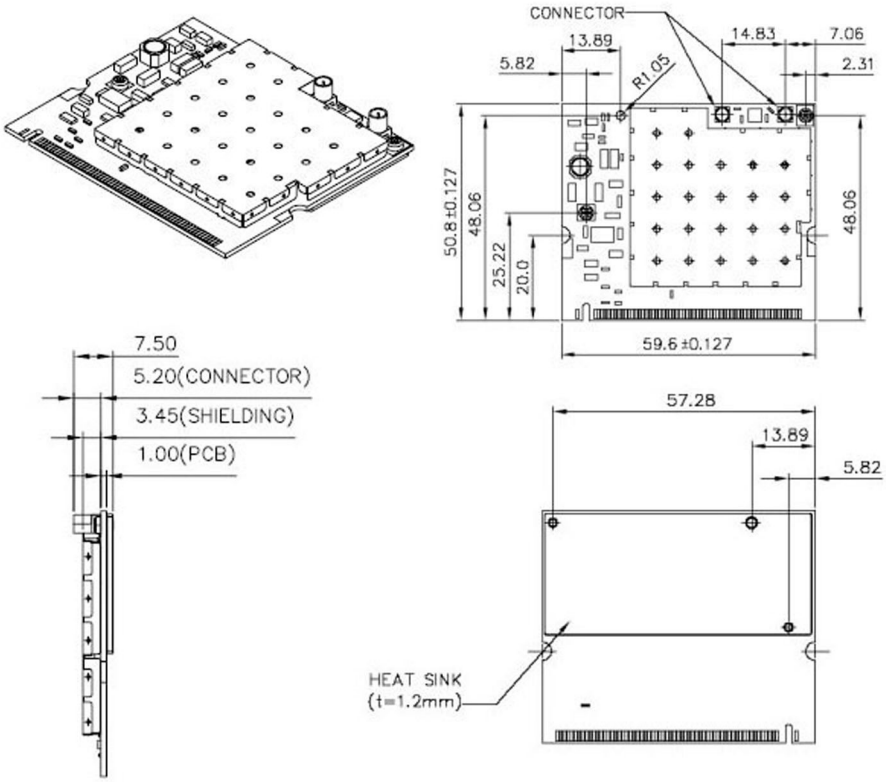
- Industrial grade –40°C ~ 80°C design ensures durability for rugged devices.
- Average power up to 200mW (23dBm) and peak power up to 600mW (28dBm) on both 802.11a and 802.11 b/g modes provide superior wifi coverage.
- Mini-PCI Type IIIA form factor with screw hole is ideal for solid mounting onto motherboard.
- Supported by MADWiFi providing Linux kernel drivers for industrial, academic, or personal projects at highest flexibility and lowest cost.
- Windows 98/ME/2000/XP/NT4.0/Vista drivers and site survey function provide immediate 11a/b/g wifi and management capability.
- Optional WinCE4.2/5.0 drivers assure trouble-free WiFi integration.
- Supports universal 802.11a/11g/11b auto fallback data rate and seamless roaming among 802.11a, 802.11b, and 802.11g multiple AP wifi networks.
- Future support of 802.11d (Regulatory Domain), 802.11e (Quality of Service, WMM), and 802.11h (TPC/DFS/DFS2) by software upgrade.
- Supports 64/128/152-bit WEP encryption, IEEE 802.1x authentication, AES & TKIP, and CCX3.0 encryption.
- Heat sink design provides reliable high power RF performance.
- Two MMCX antenna connectors enable robust assembly and lower loss for external antenna.
- RoHS compliance meets environment-friendly requirement.

Hardware Block Diagram



Mechanical Outline

Unit: mm



Specifications:	
Main Chipset	Atheros®AR5414A-B2B
Standard Conformance	IEEE 802.11a, 802.11b, 802.11g
Frequency Range	▪ 802.11a mode: ▫ 5.15~5.35GHz & 5.725~5.85GHz for US ▫ 4.9~5.35GHz for Japan ▫ 5.15~5.35GHz & 5.47~5.725GHz for ETSI ▫ 5.725~5.85GHz for China ▪ 802.11b/g mode: ▫ 2.400~2.4835GHz for US, Canada, Japan, ETSI, and China
Channel Bandwidth	▪ 802.11a mode: 40MHz, 20MHz, 10MHz, and 5MHz ▪ 802.11b mode: 20MHz ▪ 802.11g mode: 40MHz, 20MHz, 10MHz, 5MHz
Interface	32-bit mini-PCI Type IIIA
Operation Voltage	3.3VDC ± 10% (5VDC optional by project)
Modulation Technique	▪ 802.11a: ▫ OFDM with BPSK, QPSK, 16-QAM, and 64-QAM ▪ 802.11b: ▫ DSSS with CCK, DQPSK, and DBPSK ▪ 802.11g: ▫ OFDM with BPSK, QPSK, 16-QAM, and 64-QAM ▫ DSSS with CCK, DQPSK, and DBPSK

Specifications:	
Data Rate	▪ 802.11a (normal mode): 54, 48, 36, 24, 18, 12, 9, 6Mbps, auto-fallback ▪ 802.11a (Super mode): 108, 96, 72, 48, 36, 24, 18, 12Mbps, auto-fallback ▪ 802.11b(normal mode): 11, 5.5, 2, 1Mbps, auto-fallback ▪ 802.11g(normal mode): 54, 48, 36, 24, 18, 12, 9, 6Mbps, auto-fallback ▪ 802.11g (Super mode): up to 108Mbps
Operating Range (subject to the environment and antenna)	▪ 802.11a ▫ outdoor: over 350 meters @ 6Mbps ▫ indoor: 45~120 meters @ 6Mbps ▪ 802.11b ▫ outdoor: over 400 meters @ 11Mbps ▫ indoor: 45~120 meters @ 11Mbps ▪ 802.11g ▫ outdoor: over 400 meters @ 6Mbps ▫ indoor: 45~120 meters @ 6Mbps
Operating Channels	▪ 802.11a ▫ USA/Canada: 12 non-overlapping channels (channel 36, 40, 44, 48, 52, 56, 60, 64, 149, 153,157, 161) ▫ Major Europe Countries: 19 non-overlapping channels (channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140) ▫ Japan: 5.17/5.19/5.21/5.23GHz (channel 34, 38, 42, 46) for J52 ▫ 5.18/5.20/5.22/5.24/5.26/5.28/5.30/5.32GHz (channel 36, 40, 44, 48, 52, 56, 60, 64) for W52 and W53 ▫ 4.92/4.94/4.96/4.98/5.04/5.06/5.08 GHz for 4.9GHz band ▪ 802.11b/g ▫ USA/Canada: 11 (1~11) ▫ Major Europe Countries: 13 (1~13) ▫ France: 4 (10~13) ▫ Japan: 14 for 802.11b (1~13 or 14th), 13 for 802.11g (1~13) ▫ China: 13 (1~13)
Power Consumption	▪ 802.11a mode: ▫ Continue Tx: 1100mA (typical)~1300mA (max) ▫ Continue Rx: 250mA (typical)~270mA (max) ▫ Standby mode: 280mA (typical)~290mA (max) ▫ Power saving: 35mA (typical)~55mA (max) ▫ Radio off: 40mA (typical)~50mA (max) ▪ 802.11b mode: ▫ Continue Tx: 730mA (typical)~780mA (max) ▫ Continue Rx: 200mA (typical)~220mA (max) ▫ Standby mode: 230mA (typical)~240mA (max) ▫ Power saving: 35mA (typical)~55mA (max) ▫ Radio off: 40mA (typical)~50mA (max) ▪ 802.11g mode: ▫ Continue Tx: 730mA (typical)~780mA (max) ▫ Continue Rx: 240mA (typical)~260mA (max) ▫ Standby mode: 280mA (typical)~290mA (max) ▫ Power saving: 35mA (typical)~55mA (max) ▫ Radio off: 40mA (typical)~50mA (max)
Power Consumption under Chariot Test	▪ 802.11a mode (Chariot Tx: Throughput.scr) ▫ 22dBm output power: 6Mbps@ 5.825GHz: 870mA(typ.) ▫ 19.5dBm output power: 36Mbps@ 5.825GHz: 630mA(typ.) ▫ 18dBm output power: 54Mbps@ 5.825GHz: 550mA(typ.) ▪ 802.11b mode (Chariot Tx: Throughput.scr) ▫ 24.5dBm output power: 11Mbps@ 2.437GHz: 750mA(typ.) ▫ 24dBm output power: 1Mbps@ 2.437GHz: 830mA(typ.) ▪ 802.11g mode (Chariot Tx: Throughput.scr) ▫ 24.5dBm output power: 6Mbps@ 2.437GHz: 780mA(typ.) ▫ 21dBm output power: 54Mbps@ 2.437GHz: 480mA(typ.)
Antenna	two MMCX antenna connectors for diversity function Remark: please make sure to install two antenna on these two antenna ports. For single antenna application, one 50 Ohm terminator (or Unex's ACMCX-2) installation on the other antenna port is required. This is a high-power module, PA will be damaged and cause DC-shorted if leave antenna port open during transmission.

Specifications:	
Transmit Power Settings	▪ 802.11a: ▫ +22 ~ 24dBm @ 6, 9, 12, 18, 24Mbps ▫ +21 ~ 23dBm @ 36Mbps ▫ +18.5 ~ 20.5dBm @ 48Mbps ▫ +17.5 ~ 19dBm @ 54Mbps ▪ 802.11b: ▫ +23.5 ~ 24.5dBm @ 1, 2, 5.5, 11Mbps ▪ 802.11g: ▫ +24 ~ 24.5dBm @ 6, 9, 12,18, 24Mbps ▫ +22 ~ 22.5dBm @ 36Mbps ▫ +20.5 ~ 21.5dBm @ 48Mbps ▫ +19.5 ~ 21dBm @ 54Mbps
MAC Protocol	CSMA/CA with ACK architecture 32-bit MAC
Security	▪ 64-bit, 128-bit and 152-bit WEP encryption ▪ 802.1x authentication ▪ AES-CCM & TKIP encryption ▪ CCX3.0
Operation Systems Supported	Windows 98SE, Windows Me, Windows 2000, Windows XP, Windows NT4.0, Windows Vista, MADWiFi Linux
WHQL	Windows 2000, XP
Wi-Fi Compliance	WECA compliance
Radio Option	hardware radio On/Off support
Advanced Function	▪ SuperAG® ▪ eXtended Range ▪ JumpStart V1.0 on Microsoft 2000, XP
Dimension	59.6 mm(L) x 50.8mm(W) x 7.5mm(H)
Operation Temperature Range	-40°C~+80°C Remark: the throughput may degrade 15% for modulation QAM16 and QAM64 at –40°C)
Storage Temperature Range	-45°C~+85°C
Operating Humidity	10%~95%, non-condensing
Storage Humidity	max. 95%, non-condensing
EMC Certificate	FCC part 15C, CE ETSI EN301893 EN60950
Environment-Friendly Compliance	RoHS

Orderign Information:	
CM10-HI (MMCX)	Industrial grade, high power 802.11 a/b/g wifi mini-PCI module, AR5414A-B2B
ACMCX-2	50 Ohm MMCX terminator