Industrial-grade, high-power 5.47~5.725GHz wifi mini-PCI module w/ESD and Surge Protection, AR5414A-B2B

Model: DCMA-86III

DCMA-86III is a 5.47 ~ 5.725GHz industrial-grade, high-power wifi mini-PCI module with accurate high (25dBm) and lower (2.5dBm) power control from –40°C ~ +80°C temperature range and integrated RF ESD/Surge protection circuit.

Equipped with high rejection Dielectric Resonator (DR) filters for 5.47~5.725GHz frequency applications, DCMA-86III is designed to overcome Adjacent Channel Interference (ACI) and increase bandwidth efficiency in 802.11a deployments to better overall network performance.

Both high and lower power control accuracy in –40°C ~ +80°C temperature range can be used to reduce in-band frequency interference of RF signal sources to dramatically improve the data throughput and range performance of Access Points and Clients in high-density enterprise and commercial hot-spot deployments.

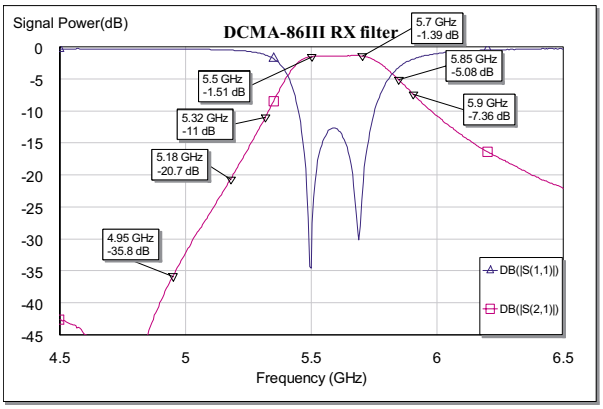
RF ESD/Surge protection up to 14KV ensures highest levels of performance and reliability in the harshest outdoor environment such as mesh networking, military, bridging, and infrastructure applications.

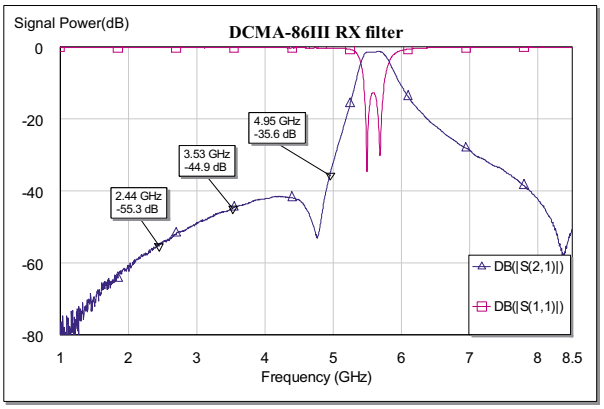
Leveraging RF expertise, continuous RD innovation, highly successful DCMA-86 and DNMA-H92, DCMA-86III is the newest innovation of 5.47 ~ 5.725GHz wifi mini-pci with accurate power control from 25dBm high power to 2.5dBm lower power and RF ESD/Surge protection up to 14KV.

Key Features:

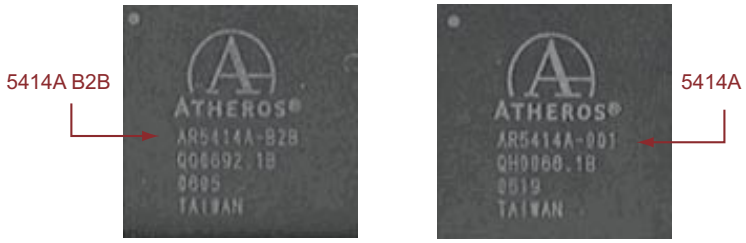
- Equipped with high rejection Dielectric Resonator (DR) filters to operate in 5.47~5.725GHz frequency to overcome Adjacent Channel Interference (ACI) and increase bandwidth efficiency in 802.11a deployments to better overall performance.
- Accurate high (25dBm) and lower (2.5dBm) power controls in –40°C ~ +80°C temperature range can be used to reduce in-band frequency interference to dramatically improve the data throughput and range performance in high-density enterprise and commercial hot-spot deployments.
- RF ESD and Surge protection up to 14KV ensure highest levels of performance and reliability in the harshest outdoor mesh/military deployments.
- Industrial grade –40°C ~ 80°C design ensures durability for rugged devices.
- Average power up to 300mW (25dBm)/peak power up to 1000mW (30dBm) with superior sensitivity provide better than average wifi transmission coverage.
- PA damage protection circuit enables direct antenna switch behind the MMCX connector.
- Dual power supply plus heat sink design makes critical components temperature cooler by up to 10°C , significantly reduces components aging caused by thermal in high power application to secure long-term performance reliability.
- Low noise amplifier (LNA) dramatically improves sensitivity provide better than average wifi transmission coverage.
- Less than 50mV output ripple design ensures high performance while remaining conscious of power efficiency.
- PA fine-tuning gains balance of linearity and power consumption with enough margin while maintaining adequate Tx power to ensure no major performance degradation over time.
- Same EVM on both light and heavy loading maintain lower packet error to increase channel efficiency.
- Mini-PCI Type IIIA form factor with screw hole is ideal for solid mounting onto motherboard.
- Supported by MadWifi and ath5k providing Linux kernel drivers for industrial, academic, or personal projects at highest flexibility and lowest cost.
- Windows 2000/XP/Vista and Linux drivers and site survey function provide immediate 11a/b/g wifi and management capability.
- Linux driver source code sub-license available by project.
- 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.
- One DIP type MMCX RF connector enables robust assembly and lower loss for external antenna.
- RoHS compliance meets environment-friendly requirement.
- Flexible power supply design to easily change from 3.3Vdc (default) to 3.3Vdc+5Vdc by only one on-board resistor shift to meet power budget requirement of different platforms.

Frequency Response of DCMA-86III:





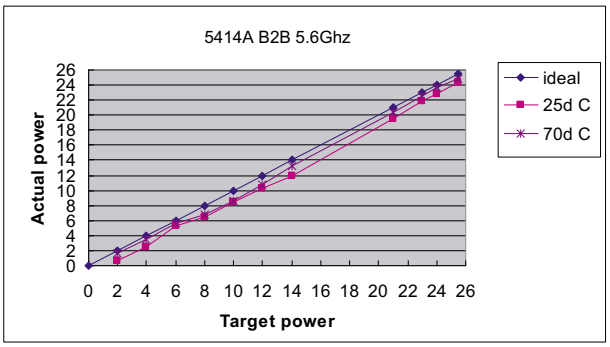
Why AR5414A B2B required for Industrial Applications?



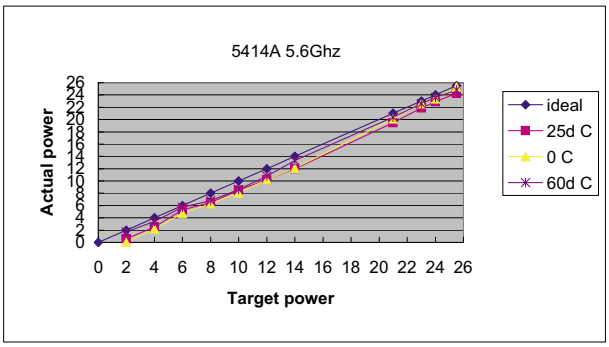
Industrial grade AR5414A B2B chipset is for applications in the most-demanding environments in the world. It must withstand tremendous temperature, humidity, and ambient air ranges. By contrast, the commercial grade AR5414A is for applications generally placed in a climate-controlled environment that is carefully monitored to ensure optimum performance.

1. In normal temperature range 0 –60°C: the power control accuracy of wifi modules using either AR5414A B2B or AR5414A chipset can be the same precise for a professional company as Unex.

industrial grade

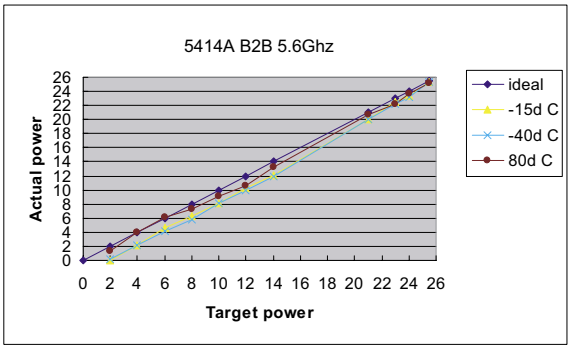


commercial grade

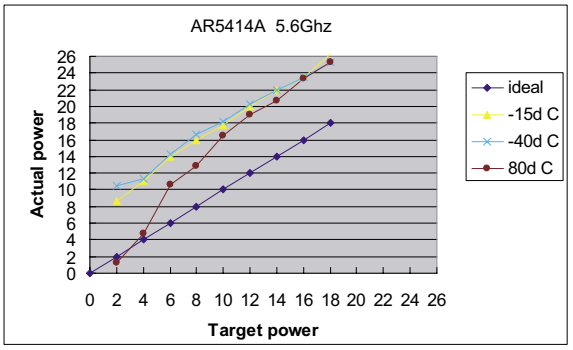


2. At temperature of –15°C, -40°C or +80°C, obvious power control accuracy differences can be found on the test result of AR5415A B2B and AR5414A.

industrial grade

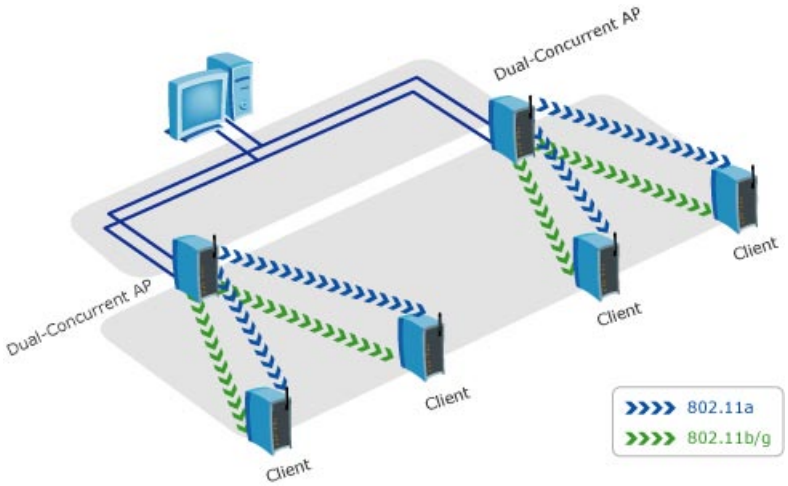


commercial grade



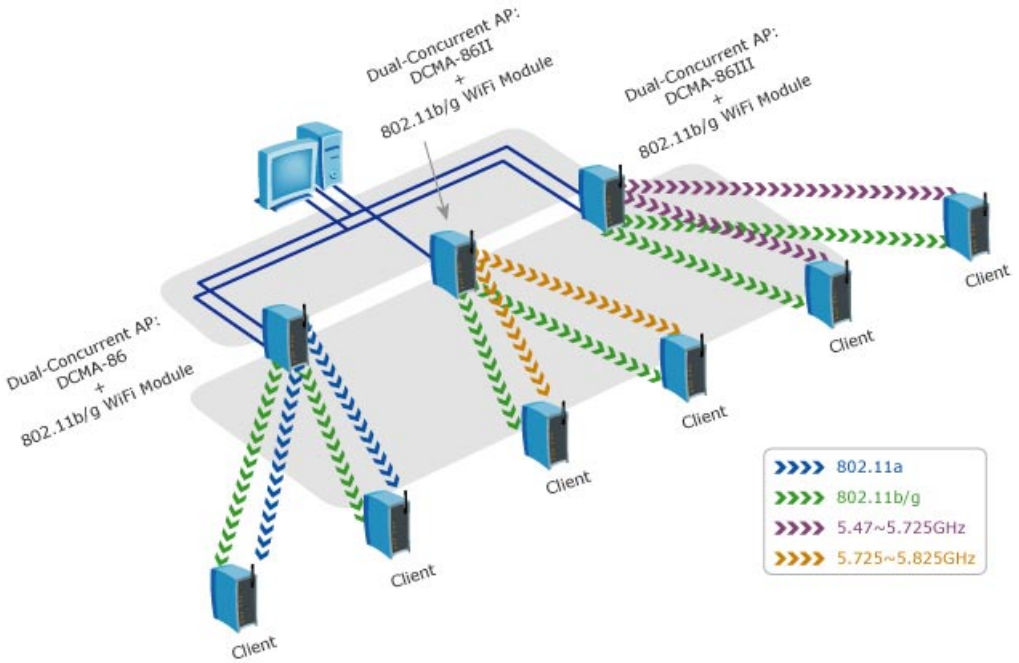
Advanced Applications of DCMA-86, DCMA-86II, and DCMA-86III

1. Today's Dual-Concurrent WiFi Architecture
   two independent WiFi modules are used to form independent WiFi connections with 802.11b/g and 802.11a frequencies to avoid interruptions in transmission due to radio interference.

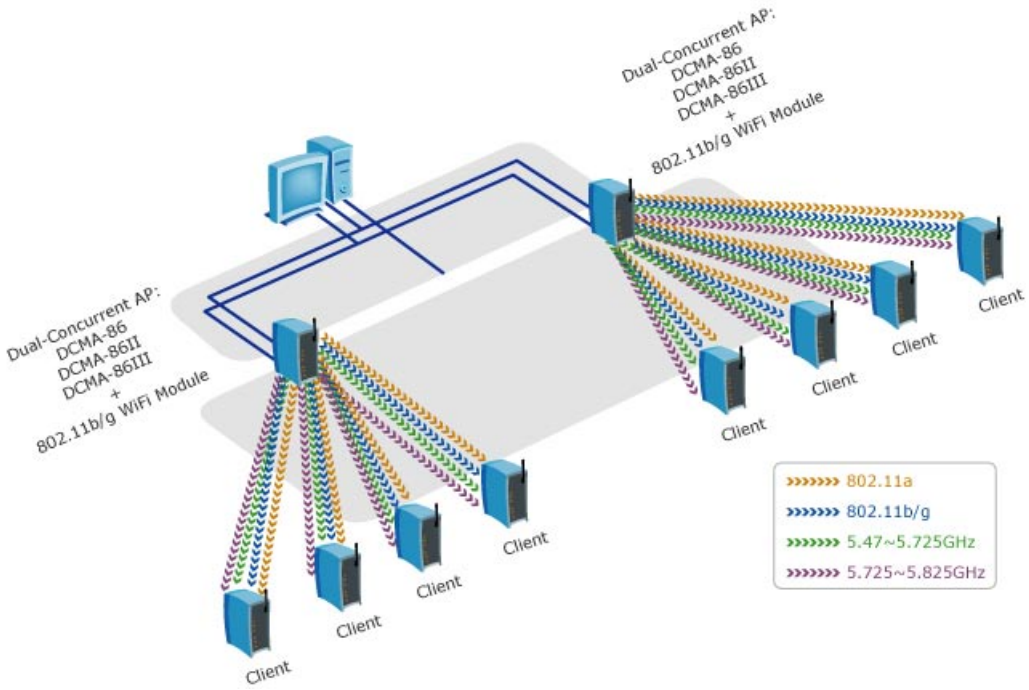


2. Tomorrow's Multi-Concurrent WiFi Architecture
   Unex raises the bar by providing more than two WiFi modules to enable four independent WiFi connections and increase bandwidth efficiency in 802.11a deployments to better overall network performance.

   2-1. more than two dual-concurrent AP application: use DCMA-86, DCMA-86II, and DCMA-86III in different APs to replace today's standard 802.11a WiFi modules to minimize radio interference and better overall network performance.



   2-2. quad-concurrent AP application: use DCMA-86, DCMA-86II, DCMA-86III and a standard 802.11b/g GHz WiFi modules in a quad-concurrent AP to better overall network performance and double secure WiFi connection's reliability than dual-concurrent.



Specifications:

Chipset	Atheros AR5414A-B2B
Frequency Range	5.47 ~ 5.725GHz
Channel Bandwidth	40MHz, 20MHz, 10MHz, and 5MHz
Interface	32-bit mini-PCI Type IIIA
Operation Voltage	3.3V ± 5%
Modulation Technique	OFDM with BPSK, QPSK, 16-QAM, and 64-QAM
Data Rate	▪ normal mode: 54, 48, 36, 24, 18, 12, 9, 6Mbps, auto-fallback ▪ SuperA mode: 108, 96, 72, 48, 36, 24, 18, 12Mbps, auto-fallback
Operating Range	▪ indoor: up to 200 meters, antenna dependent ▪ outdoor: up to 50 km, antenna dependent

Transmit Power

	5500MHz Ave./Peak	5700MHz Ave./Peak
6M	24.5/29.5dBm	25/30dBm
9M	24.5/29.5dBm	25/30dBm
12M	24.5/29.5dBm	25/30dBm
18M	24.5/29.5dBm	25/30dBm
24M	24/29dBm	25/30dBm
36M	24/29dBm	24/29dBm
48M	21/26dBm	22/27dBm
54M	20/25dBm	21/26dBm

Sensitivity

	Min.(-40°C)	Typical(+25°C)	Max.(+80°C)
6M	-96dBm	-93dBm	-90dBm
9M	-96dBm	-93dBm	-90dBm
12M	-94dBm	-91dBm	-88dBm
18M	-92dBm	-89dBm	-86dBm
24M	-89dBm	-86dBm	-83dBm
36M	-85dBm	-82dBm	-79dBm
48M	-80dBm	-77dBm	-74dBm
54M	-78dBm	-75dBm	-72dBm

Power Consumption

3.3V power supply only:

	25°C	70°C	80°C	-15°C	-40°C
Cont. Tx @ 25dBm 6M	1.65A	1.52A	1.53A	1.31A	1.23A
Cont. Tx @ 21dBm 54M	1.15A	1.15A	1.16A	0.98A	0.93A
Chariot @ 25dBm 6M	1.5A		1.36A		1.13A
Cont. Rx	0.26A	0.27A	0.27A	0.26A	0.26A
Idle	0.3A	0.3A	0.3A	0.3A	0.28A

3.3+5V power supply @ 25°C:

	3.3V	5.0V
Cont. Tx @ 25dBm 6M	0.7A	0.48A
Cont. Tx @ 21dBm 54M	0.61A	0.31A

Antenna	one DIP MMCX RF connector for robust antenna assembly
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 2000, Windows XP, Windows Vista, Windows 7, Linux, MadWifi, ath5k. Linux driver source code sub-license by project request.
Radio Option	hardware radio On/Off support

Specifications:	
Advanced Function	▪ SuperA® ▪ eXtended Range ▪ JumpStart V1.0 on Microsoft 2000, XP, Vista
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
Environment-Friendly Compliance	RoHS

Ordering Information:	
DCMA-86III	Industrial-grade, high-power 5.47~5.725GHz wifi mini-PCI module w/ESD and Surge Protection, AR5414A-B2B
ESD Cable	UL 1007 18AWG, length 19cm, for ground end to enclosure point tied to Earth Ground.