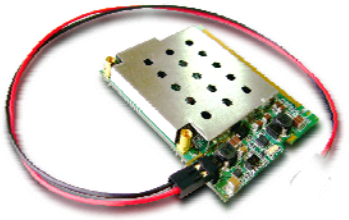
EnGenius | DATASHEET

Atheros 6thG Mini-PCI Adapter — *EMP-8603 Premium*

2.4 / 4.9 / 5 GHz | 802.11a/b/g | 108 Mbps

Engenius EMP-8603 Premium radio module performs extreme high power and economizes the power consumption on the system platform. It supports Atheros Turbo mode with high-speed wireless connection with data rate up to 108Mbps. EMP-8603 Premium is mini-PCI types A module, supports dual-band (2.4GHz & 5GHz) high transmit output power up to 500mW in 5GHz and 800mW in 2.4GHz. For outstanding performance on the extremely output power, it enables the longer transmit distance & provides the wider bandwidth & backhaul for 5GHz.



With enhanced features on the ESD protection, industrial-based operating temperature, economized system power consumption, industrial-best sensitivity than normal module, MMCX connectors, and stable heating protection design, makes the module is easily to integrate into a wide range of any platform.

Features	Benefits
500mW output power in 5GHz	Wider bandwidth & backhaul for 5GHz
800mW output power in 11b, and **600**mW in 11g	Improve high and successful transmit range
Turbo mode support	Supports Super A/G up to 108Mbps data rate
Industrial-best sensitivity	-94 dBm @ 6 Mbps , -74 dBm @ 54 Mbps
Advanced power consumption management	Effectively reduce the total power consumption on the platform up to 3.5W
Improving the heat issue	MTBF reliability improvement and keeps the system free from heat issue
ESD protection up to 16 kV	Make the module & platform more reliable and stable
Industrial-based operating temperature	Extended operating temperature -40~+85C
MMCX antenna connectors	Two MMCX connectors (One is for 2.4GHz, and the other is for 5GHz)
5/10/20 Channel bandwidth support	It's optional for special request, makes your RF management more flexible

* Theoretical wireless signal rate based on IEEE standard of 802.11a, b, g chipset used. Actual throughput may vary. Network conditions and environmental factors lower actual throughput rate.

** All specifications are subject to change without notice. 8/5/2008

General information					
Chipset (Refer to order Info in page4)	Atheros 6th Generation, **AR5414/AR5413**				
Radio operation	802.11a: 4.92~4.98GHz & 5.04~5.08GHz / 5.18~5.825 GHz				
	802.11b/g : 2.4GHz				
Interface	32-bit miniPCI Type III A				
Operating voltage	Mini_PCI Slot : DC 3.3 V ± 5% with Advanced DC Power management support				
	With External Jump wire : DC 5 V or 9 ~ 24 V				
Antenna connectors	2 MMCX connectors (One is for 5GHz, the other is for 2.4GHz)				
Temperature range	- 40°C to + 85 ˚C (Operating temperature)				
	-45°C to + 90°C (Storage temperature)				
Security	WPA, WPA2, 64/128 bit WEP, TKIP, and AES. hardware-based IEEE 802.11i encryption engine				
Data rates	6, 9, 12, 18, 24, 36, 48, and 54Mbps (11a /11g)				
	1, 2, 5.5, and 11Mbps (11b)				
Bandwidth control support	5MHz / 10MHz / 20MHz				
Standard/Compliance	WECA (Wi-Fi & Wi-Fi5 compliance), IEEE802.11, IEEE802.11a/b/g, RoHS and WEEE				
Regulation Certifications	FCC Part 15				
Radio frequency band					
Channel	Data rate	Tx AVG. power (dBm)	Tolerance	Rx Sensitivity	Tolerance
802.11a (4.92~5.825 GHz)	6 Mbps	26 dBm	+1 /-1.5 dB	-92 dBm	+/-1.5 dB
	9 Mbps	26 dBm	+1 /-1.5 dB	-92 dBm	+/-1.5 dB
	12 Mbps	26 dBm	+1 /-1.5 dB	-90 dBm	+/-1.5 dB
	18 Mbps	26 dBm	+1 /-1.5 dB	-89 dBm	+/-1.5 dB
	24 Mbps	26 dBm	+1 /-1.5 dB	-85 dBm	+/-1.5 dB
	36 Mbps	24 dBm	+1 /-1.5 dB	-82 dBm	+/-1.5 dB
	48 Mbps	22 dBm	+1 /-1.5 dB	-76 dBm	+/-1.5 dB
	54 Mbps	20 dBm	+1 /-1.5 dB	-73 dBm	+/-1.5 dB
802.11g (2.412~2.472GHz)	6 Mbps	27 dBm	+1 /-1.5 dB	-94 dBm	+/-1.5 dB
	9 Mbps	27 dBm	+1 /-1.5 dB	-93 dBm	+/-1.5 dB
	12 Mbps	27 dBm	+1 /-1.5 dB	-92 dBm	+/-1.5 dB
	18 Mbps	27 dBm	+1 /-1.5 dB	-91 dBm	+/-1.5 dB
	24 Mbps	27 dBm	+1 /-1.5 dB	-87 dBm	+/-1.5 dB
	36 Mbps	25 dBm	+1 /-1.5 dB	-84 dBm	+/-1.5 dB
	48 Mbps	24 dBm	+1 /-1.5 dB	-78 dBm	+/-1.5 dB
	54 Mbps	23 dBm	+1 /-1.5 dB	-74 dBm	+/-1.5 dB
802.11b (2.412~2.472GHz)	1Mbps	28 dBm	+1 /-1.5 dB	-97 dBm	+/-1.5 dB
	2Mbps	28 dBm	+1 /-1.5 dB	-96 dBm	+/-1.5 dB
	5.5Mbps	28 dBm	+1 /-1.5 dB	-95 dBm	+/-1.5 dB
	11Mbps	28 dBm	+1 /-1.5 dB	-92 dBm	+/-1.5 dB
Power offset table (Target power vs Actual output power)					
802.11a	7dB				
802.11b/g	9dB				
Current consumption information					
Tx current conmsumption (without Jump wire)	Continuous TX @ 802.11.a	≦ 2 A			
	Continuous TX @ 802.11.b/g	≦ 1.4 A			
Rx current consumption	Continuous RX	≦ 400 mA			
Card on Current	Data Communicating with AP	≦ 400 mA			
Sleep Current	Sleep mode	≦ 100 mA			
Advanced DC Power consumption management					
Jump wire on	External DC power in supported , Voltage 5 V or 9 ~ 24 V				
Jump wire off	Only support DC Power from mini-PCI slot (3.3 V)				
Cable dimension	30cm				
Driver information					
Windows driver	Windows driver XP/2000				
Linux driver	Mad WiFi				

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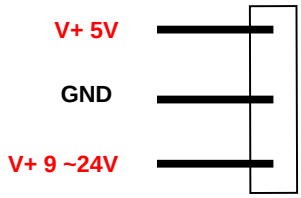
Economize on power consumption design–

Auto-switching mechanism with a jump wire (Plug and Play)

PIN assignment of the PIN Header on mini-PCI



Selection A: External DC power in, support V+ 5V

a. Red pin connects to V+ 5V, Max power < 5W
b. Black pin connects to GND

Selection B: External DC power in, support V+ 9 ~ 24V

a. Red pin connects to V+ 9 ~ 24V , Max power < 5W
b. Black pin connects to GND

Selection C: No power saving mode. Remove the Jump wire ➔ Power supply from mini-PCI slot (3.3 V) only.

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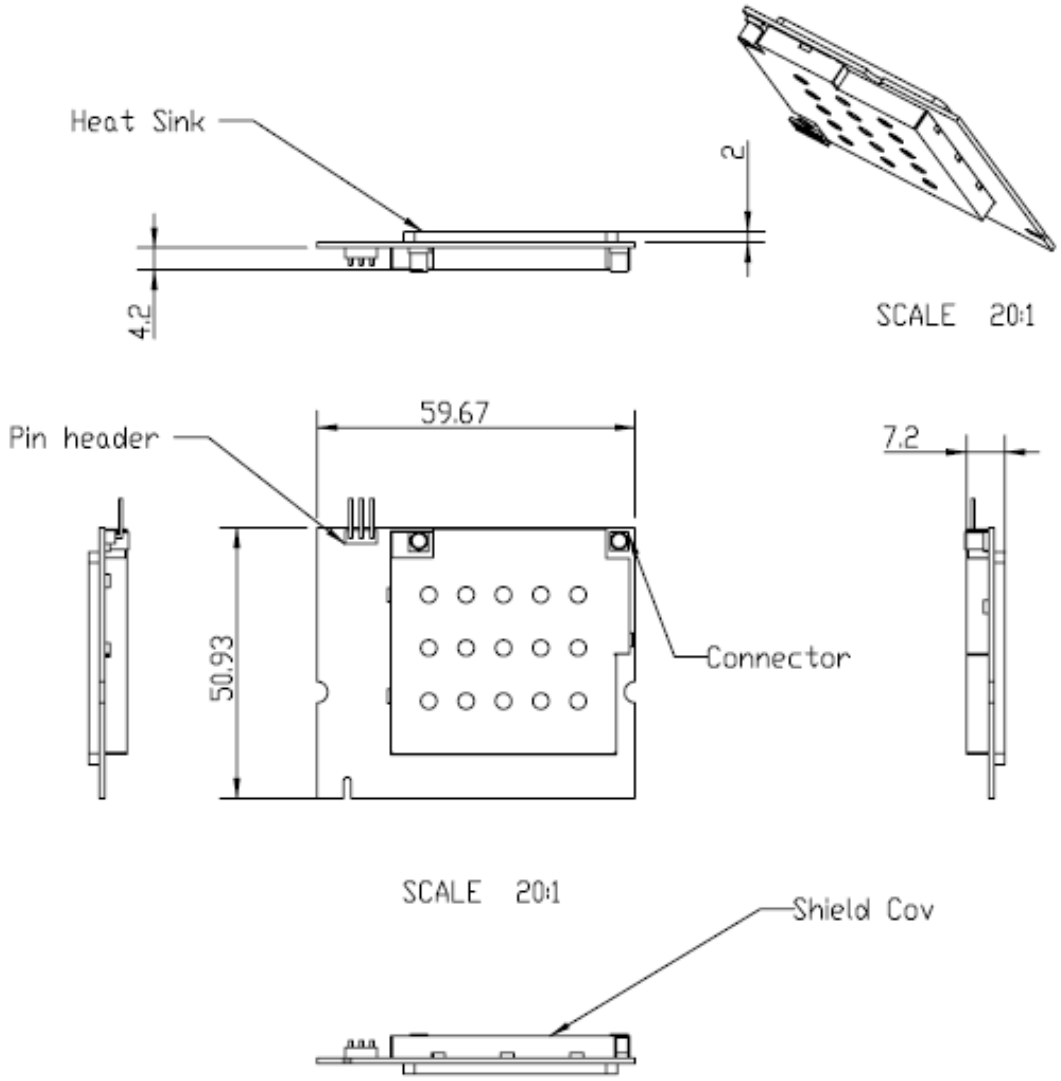
Mechanical Dimensions



Order Information	Chipset	Throughput
EMP-8603 Premium	AR5413	54Mbps
EMP-8603S Premium	AR5414	108Mbps

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