Publication Number 17-3540-02

Nano Socket iWiFi™

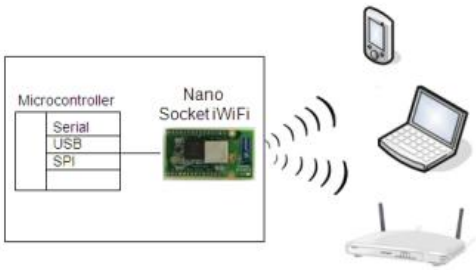
Miniature embedded WiFi module family

- ***Onboard antenna***

General Description:

Nano Socket iWiFi™ is a secure embedded Wireless LAN bridge that easily connects embedded devices to 802.11b/g Wireless LANs. It includes the iChip™ CO2144 IP Communication Controller™ chip and Marvell 88W8686 WiFi chipset. It is packaged in an RoHS-compliant ultra-slim low profile form factor.

Nano Socket iWiFi is pin and form compatible with the Nano SocketLAN, allowing customers to easily offer dual mode (LAN & WiFi) product options.



Nano Socket iWiFi makes adding WiFi connectivity to embedded devices easy. It does not require any kind of WiFi driver development on the host CPU, and its multiple interface (UART, SPI, RMII and USB) minimize the need to redesign the host device hardware. Connect One's high-level AT+i™ API eliminates the need to add WiFi drivers, security & networking protocols and tasks to the host application.

Nano Socket iWiFi supports SSL3/TLS1 protocol for secure sockets, HTTPS and FTPS, WEP, WPA/WPA2 (both PSK and Enterprise) WiFi encryption.

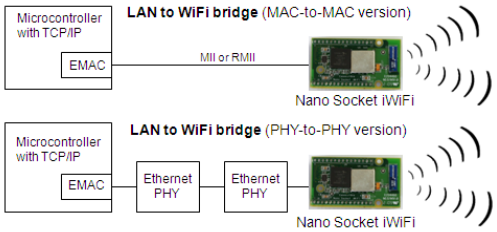
Nano Socket iWiFi firmware and configuration parameters are stored in on-board flash memory. The module is power-efficient, offering several Power Save modes.

Typical applications:

- Adding WiFi to serial embedded devices
- Replacing LAN cable using WiFi
- Adding SSL security to M2M solutions
- For dual mode (LAN/WiFi) solutions – same footprint as Nano SocketLAN

Nano Socket iWiFi supports several operation modes:

- LAN to WiFi Bridge - allowing transparent bridging of LAN over WiFi, using direct RMII connection to existing MAC hardware or direct PHY-to-PHY connection.



- SerialNET™ Serial to WiFi Bridge - allowing transparent bridging of Serial over WiFi, using the 3Mbps fast UART. This is a true plug-and-play mode that eliminates any changes to the host application.
- PPP modem emulation – allowing existing (e.g. modem) designs currently using PPP to connect transparently over WiFi
- Full Internet Controller mode – allowing simple MCU to use the Nano Socket iWiFi's rich protocol and application capabilities to perform complex Internet operations such as E-mail, FTP, SSL, embedded web server and others. It also acts as a firewall, providing a security gap between the application and the network.

The II-EVB-363MO evaluation board provides an easy environment for evaluating the Nano Socket iWiFi.

International:
Connect One Ltd.
20 Atir Yeda Street
Kfar Saba 44643, Israel
Phone: +972-9-766-0456
Fax: +972-9-766-0461
Email: sales@connectone.com
http://www.connectone.com

USA:
Connect One Semiconductors, Inc.
560 S. Winchester Blvd.
Suite 500
San Jose, CA 95128
Tel: (408) 572-5675
Fax: (408) 572-5601

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Hardware Description:

- Size: 45.21 x 24.88 x 7.3 mm
- Core CPU: Connect One CO2144, low-leakage, 0.13 micron, at 48MHz
- Operating Voltage: +3.3V+/-10%
- Operating Humidity: 90% maximum (non-condensing)
- Operating Temperature Range: -20°c to +75°c (-4° to 167°F)
- Power Consumption:
  - Transmit –250mA@16dbm, 235mA@12dbm (typical)
  - Receive – 190mA (typical)
  - Power Save mode – 8mA
- Antenna: Onboard 2DBi PCB type antenna
- Connectors: two 1x15 pin header
- Host Interface: Serial, SPI, RMII and USB device.
- RoHS-compliant; lead-free

Wireless Specifications:

- Standards supported: IEEE 802.11b/g
- Frequency: Europe – 2.412-2.472GHz
  USA – 2.412-2.462GHz
- Channels: Europe – 13 channels
  USA – 11 channels

Performance Specifications:

- Host Data Rates:
  - UART: Up to 3Mbps
  - SPI: Up to 12Mbps
  - RMII: Up to 50MHz/12Mbps TCP
- Serial Data Format (AT+i mode): Asynchronous character; binary; 8 data bits; no parity; 1 stop bit
- Serial Data Format (SerialNET mode): Asynchronous character; binary; 7 or 8 data bits; odd, even, or no parity; 1,1.5,2 stop bits
- Flow Control: Hardware (-RTS, -CTS) and software flow control.

Internet Protocols:

- ARP, ICMP, IP, UDP, TCP, DHCP, DNS, NTP, SMTP, POP3, MIME, HTTP, FTP and TELNET
- Security protocols: SSL3/TLS1, HTTPS, FTPS, RSA, AES-128/256, 3DES, RC-4, SHA-1, MD-5, MD-2, WEP, WPA/WPA2 (PSK and Enterprise)
- Protocols accelerated in hardware: AES, 3DES and SHA

Application Program Interface:

- AT+i protocol for Internet Controller mode
- LAN-WiFi transparent bridging
- SerialNET mode for transparent serial data-to-Internet bridging
- PPP operation mode for Modem-WiFi conversion

Warranty:

One year

Certifications:

Radio and EMC:

- USA
  - o FCC Modular Approval, FCC ID: XM5-SM2144N2
  - o CFR Title 47 FCC Part 15, Subpart B and C
- Canada
  - o Industry Canada Module Approval, IC: 8516A-SM2144N2
  - o Industry Canada ICES-003, RSS-Gen, RSS-210
- EU
  - o EN 300 328 (R&TTE Directive 1999/5/EC)
  - o EN 301 489 (EMC Directive 2004/108/EC)

• **Safety:**

- o UL 60950
- o CAN/CSA-C22.2 No. 60950
- o EN 60950, Low Voltage Directive (2006/95/EC)

Installation Requirements:

The Nano Socket iWiFi must be installed within a full-enclosure device that is safety certified.

International:
Connect One Ltd.
20 Atir Yeda Street
Kfar Saba 44643, Israel
Phone: +972-9-766-0456
Fax: +972-9-766-0461
Email: sales@connectone.com
http://www.connectone.com

USA:
Connect One Semiconductors, Inc.
560 S. Winchester Blvd.
Suite 500
San Jose, CA 95128
Tel: (408) 572-5675
Fax: (408) 572-5601

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Pin Assignments:

J8 Pin Assignments

#	Signal	type	Description
1	ERX0	Input	RMII Receive Data 0
2	ERX1	Input	RMII Receive Data 1
3	EMDC	Output	Management data Clock
4	ERXER	Input	RMII Receive Error
5	RMII_REF CLK	Input	RMII 50MHz Reference Clock
6	GND	Power	
7	VDD	Power	
8	RXD0	Input	UART 0 Receive
9	TXD0	Output	UART 0 Transmit
10	nCTS0	Input	UART 0 Clear To Send
11	nRTS0	Output	UART 0 Request To Send
12	DATA_RD Y	Output	Data Ready. Indicates new data is waiting to be read. Correlates to status report AT+iRP7. May be left unconnected.
13	MSEL	Input	Mode Select Enables Rescue Mode. Enables re-programming firmware. May be left unconnected.
14	nRESET	Input	Reset Module. must be at least 10mSec
15	nRF_LED	Output	RF LED indicator

J9 Pin Assignments

#	Signal	type	Description
1	ETX0	Output	RMII Transmit Data 0
2	ETX1	Output	RMII Transmit Data 1
3	EMDIO	In/Out	Management data I/O
4	CRSDV	Input	RMII Carrier Sense and Data Valid
5	ETXEN	Output	RMII Transmit Enable
6	nSPI1_CS	Input	SPI1 host chip select
7	SPI1_CLK	Input	SPI1 clock
8	SPI1_MISO	Output	SPI1 slave out
9	SPI1_MOSI	Input	SPI 1 Slave in
10	SPI1_INT	Output	SPI 1 data in buffer
11	Readiness	Output	iChip Ready. Indicates that the boot sequence completed. May be left unconnected.
12	DDM	Analog	USB Device Negative
13	DDP	Analog	USB Device Positive
14	N.C	-	Not connected
15	GND	Power	

ConnectOne™

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USA:
Connect One Semiconductors, Inc.
560 S. Winchester Blvd.
Suite 500
San Jose, CA 95128
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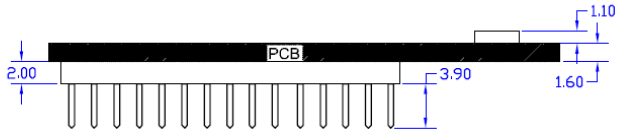
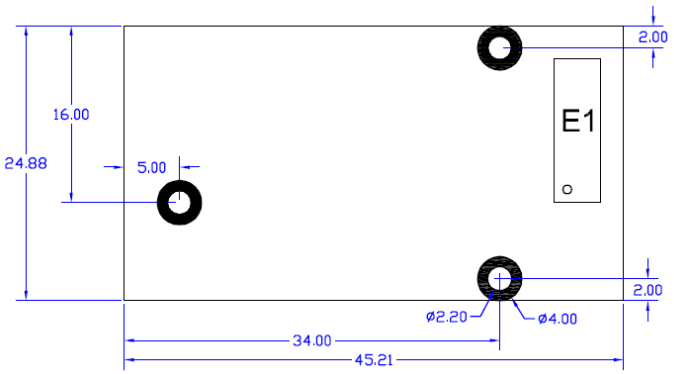
Mechanical View:

All measurements are in millimeters:

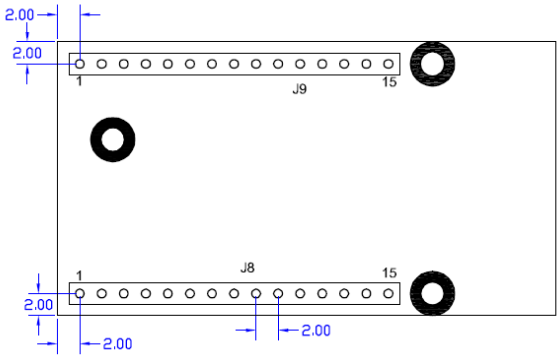
Side View:



Top View:



Bottom View:



Ordering information

	Part Number	Description
Nano Socket iWiFi - Onboard Antenna	iW-SM2144N2-US	Nano Socket iWiFi module, for USA, Onboard Antenna
	iW-SM2144N2-EU	Nano Socket iWiFi module, for Europe, Onboard Antenna
	II-EVB-363MO-US-110	Evaluation board for Nano Socket iWiFi module with Onboard Antenna for USA, with 110V power supply adapter
	II-EVB-363MO-EU-220	Evaluation board for Nano Socket iWiFi module with Onboard Antenna for Europe, with 220V power supply adapter

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