



Nano WiReach SMT-G2

Version 1.1.4

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WARNING: THE Nano WiReach SMT G2 IS AN RF MODULE INTENDED FOR EMBEDDING IN A HOST DEVICE. LOCAL RELEVANT RF REGULATIONS SUCH AS ALLOWED FREQUENCIES AND USAGE IN COMMERCIAL FLIGHTS MUST BE OBSERVED. SAFETY INSTRUCTIONS MUST BE INCLUDED IN THE MANUALS OF THE HOST DEVICE. CONNECT ONE ASSUMES NO LIABILITY FOR CUSTOMER FAILURE TO COMPLY WITH THESE PRECAUTIONS.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Option could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Exposure Information to Radio Frequency Energy

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

" Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication."

" Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante."

" This radio transmitter (SM2144N2-BIO) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device."

" Le présent émetteur radio (SM2144N2-BIO) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur."

" This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

" Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

Antennas: Air Wave (EA-79F); Tekfun C. (M04-SR); YC Communication (Q24-24W); Pulse (W1030). Maximum Gain all: 2dBi.

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Table of Contents

| | |
|---|----|
| Revision History | 6 |
| 1. Introduction..... | 7 |
| 2) General Description | 7 |
| 3) Hardware Description..... | 9 |
| 4) Performance Specifications | 9 |
| 5) Internet Protocols..... | 9 |
| 6) Security Protocols | 9 |
| 7) Application Program Interface (API)..... | 9 |
| 8) Wireless Specifications | 10 |
| 9) Recommended Antenna | 10 |
| 10) Certification | 10 |
| 11) Installation Requirements | 11 |
| 2. Features..... | 11 |
| 1) Security | 11 |
| 2) Protocols..... | 11 |
| 3) Additional Features..... | 11 |
| 3. Typical Applications..... | 12 |
| 4. AT+i Command Set | 13 |
| 5. Layout and Pin Description..... | 14 |
| 1) Layout | 14 |
| 2) Pin Functional Description | 14 |
| 6. Interfaces..... | 16 |
| 1) Serial Interface..... | 16 |
| 2) SPI Interface | 16 |
| 3) USB 2.0 Device Interface | 16 |
| 4) RMII Interface | 17 |
| 5) USB 2.0 Host Interface..... | 17 |

| | |
|--|----|
| 7. Electrical Specifications | 18 |
| 1) Absolute Maximum Ratings..... | 18 |
| 2) DC Operating Characteristics..... | 18 |
| 3) AC Operating Characteristics | 19 |
| 4) Transmit Specification | 19 |
| 5) Receive Specifications..... | 19 |
| 6) On Board Antenna | 20 |
| 8. Mechanical Dimensions..... | 21 |
| 9. PCB Footprint Design Recommendation..... | 22 |
| 1) Host PCB Footprint | 22 |
| 2) Antenna Clearance Requirements..... | 22 |
| 10. Evaluation Board..... | 23 |
| 11. Ordering Information..... | 23 |
| Appendix A - Internet Protocol Compliance..... | 24 |
| Appendix B – AT+I Configuration Examples | 25 |
| Automatically connect to a specific Access Point:..... | 25 |
| Create an Access Point to allow connection from mobile devices: | 25 |
| LAN – WiFi switch mode - merges Ethernet station(s) with WiFi client(s) into one logical subnet...25 | |
| Appendix C – Soldering Profile | 27 |

Revision History

| Version | Date | Description |
|---------|-----------------------------|---|
| 1.0 | May 14 th 2014 | Initial preliminary version |
| 1.1 | May 21 st 2014 | Adding AT+i commands examples |
| 1.1.1 | July 7 th 2014 | Updating security features |
| 1.1.2 | July 31, 2014 | Typo fix |
| 1.1.3 | Oct 14 2014 | Updating certifications |
| 1.1.4 | April 24 th 2015 | Updating evaluation platform and drying instruction |

1. Introduction

2) General Description

Nano WiReach™ SMT G2 is a secure serial-to-Wireless-LAN device module that can perform as a WLAN client or Access Point to connect serial devices to 802.11b/g/n Wireless LANs. It includes the iChip™ CO2144 IP Communication Controller™ chip and Broadcom BCM43362 WiFi chipset. It is packaged in RoHS-compliant ultra-slim form factor and uses an industry standard pin-out. The Nano WiReach SMT G2 can also be interfaced to a 10/100BaseT wired LAN and a USB cellular modem with some external components and glue logic.

Nano WiReach SMT G2 offers and supports large variety of features which among them:

- Ten simultaneous TCP/UDP sockets
- Two listening sockets
- Webserver with two websites
- SMTP and POP3 clients
- DHCP client/server
- POP3 SMTP client with MIME attachment
- FTP client
- TELNET client
- SerialNET™ mode for serial to IP bridging
- Gateway between a local network on it's LAN/WLAN interfaces and a WAN on any of it's other interfaces
- Switch between it's WLAN interface and the Ethernet interface when acting as a WLAN access point
- An Ethernet to WiFi bridge to connect an ETH client to a WiFi network (cable replacement)
- Security gap between the application and the network

Nano WiReach SMT G2 supports the SSL3/TLS1 protocol for secure sockets, HTTPS, FTPS and secure web server. On the WLAN interface it supports: WEP, WPA and WPA2 WiFi encryption.

Nano WiReach SMT G2 minimizes the need to redesign the host device hardware. It features a standard economical SMT footprint providing for low-cost placement on a host PCB with provisions for an on-board or external antenna. Minimal or no software configuration is needed for Nano WiReach SMT G2 to access the Wireless LAN.

Connect One's high-level AT+i™ API eliminates the need to add WiFi drivers, security and networking protocols and tasks to the host application. The AT+i SerialNET operating mode offers a true plug-and-play mode that eliminates any changes to the host application.

Nano WiReach SMT G2 firmware – the IP stack and Internet configuration parameters – are stored in an external FLASH memory.

The EVMB evaluation kit, together with the EVM-iW-SMG2SMT-OB daughter board provides an easy environment for testing the Nano WiReach SMT G2 prior to designing it into your product.

3) Hardware Description

| | |
|------------------------------|---|
| Size: | 37.0 x 20.0 x 2.5 mm |
| Core CPU: | 32-bit RISC ARM7TDMI, Low-leakage, 0.13 micron, at 48MHz |
| Operating Voltage: | +3.3V+/-10% |
| Operating Humidity: | 90% maximum (non-condensing) |
| Operating Temperature Range: | -30°C to +85°C -22°F to 185°F |
| Power Consumption (max): | Transmit – 350mA@11Mbps, 310mA@54Mbps, 310mA@72Mbps Receive – 130mA |
| Antenna: | On-Board or U.FL RF Connector |
| Connection: | 44 SMT pads |
| Host Interface: | Serial, SPI, USB Device |
| A/D Input | |
| Cellular Modem Interface: | USB Host |
| 10/100 Base T LAN Interface: | RMII (w/ext. PHY) |

4) Performance Specifications

| | |
|---------------------------------|---|
| Host Data Rate: | Up to 3Mbps in serial mode |
| Serial Data Format (AT+i mode): | Asynchronous character; binary; 8 data bits; no parity; 1 stop bit |
| SerialNET mode: | Asynchronous character; binary; 7 or 8 data bits; odd, even, or no parity; 1 stop bit |
| Flow Control: | Hardware (-RTS, -CTS) and software flow control. |

5) Internet Protocols

ARP, ICMP, IP, UDP, TCP, DHCP, DNS, NTP, SMTP, POP3, MIME, HTTP, FTP and TELNET

6) Security Protocols

SSL3/TLS1, HTTPS, FTPS, RSA, AES-128/256, 3DES, RC-4, SHA-1, MD-5, WEP, WPA and WPA2
Accelerated in HW: AES, 3DEC and SHA

7) Application Program Interface (API)

Connect One's AT+i protocol

8) Wireless Specifications

| | |
|----------------------|--|
| Standards supported: | IEEE 802.11b/g/n |
| Frequency: | Europe: 2.412-2.472GHz USA: 2.412-2.462GHz Japan: 2.412–2.484GHz |
| Channels: | Europe: 13 channels USA: 11 channels Japan: 14 channels |

9) Recommended Antenna

| | |
|---------------------------|--|
| Connect One's iW-ANT2-BL: | 2.4GHz, 2.0dBi, 50Ω, Omni-directional, 1/4 wavelength Dipole configuration, VSWR≤2.0 Height - 82.5mm, Weight – 6.3 grams |
|---------------------------|--|

10) Certification

Radio & EMC:

USA

FCC Modular Approval

FCC CFR Title 47 Part 15, Subpart C Section 15.247:2013

Canada

Industry Canada Module Approval

Industry Canada ICES-003, RSS-Gen issue 3, RSS-210 issue 8

EU

EN 300 328 V1.8.1

EN 301 489 V1.9.2 and V2.2.1

Safety:

EN 60950-1, Low Voltage Directive

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION. THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT

11) Installation Requirements

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

Drying (baking) the module before surface mount assembly is required. Modules should be dried at 110°C for 24hr before assembly.

2. Features

1) Security

Acts as a security gap between the host application and the network

One secure SSL3/TLS1 socket

Provides WEP, WPA and WPA2 Wireless LAN security

Supports multiple Certificate Authorities and both client-side and server-side authentication

Secure FTP and HTTP clients (over SSL3)

Secure Web Server

Includes a true hardware random number generator

AES, 3DES and SHA accelerated in hardware

2) Protocols

Up to 10 simultaneous TCP/UDP sockets and two listening sockets

HTTP client

HTTP web server with two on-chip websites: configuration site and application site

FTP and TELNET clients

DHCP client and server

POP3 or SMTP client allows sending and receiving textual and binary email with MIME attachments

3) Additional Features

Supports infrastructure Wireless LAN networks

SerialNET mode for serial-to-IP bridging (port server mode)

Local firmware update

Remote configuration and firmware update over the Internet

Note: For a detailed description of all available features, see the *AT+i Programmer's Manual*.

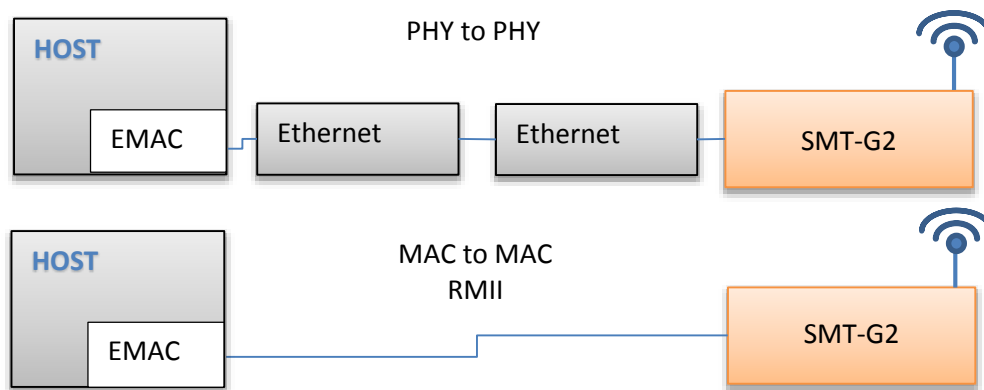
3. Typical Applications

Adding IP communications over WiFi to serial embedded devices.

Replacing a LAN cable with a WiFi connection.

Adding SSL security to M2M solutions.

LAN to WiFi Bridge - allowing transparent bridging of LAN client over WiFi (Cable replacement), using direct RMI connection to existing MAC hardware or direct PHY-to-PHY connection.

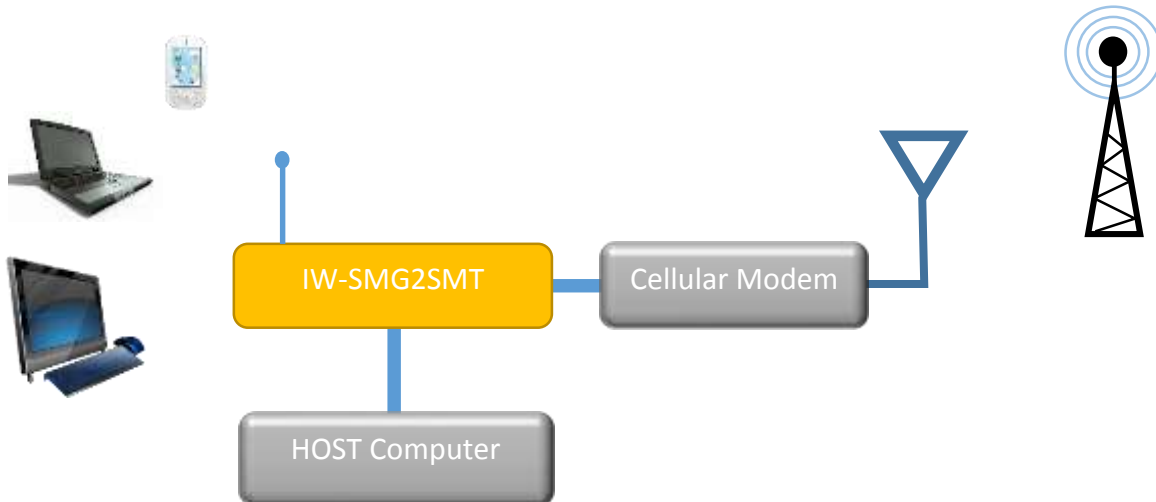


SerialNet™ Serial to WiFi Bridge - allowing transparent bridging of Serial over WiFi, using a 3Mbps fast UART. This is a true plug-and-play mode that eliminates any changes to the host application.

PPP modem emulation – allowing existing (i.e. modem) designs currently using PPP to connect transparently over WiFi.

Full Internet Controller mode – allowing simple MCU to use the Nano WiReach SMT’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.

LAN ⇔ Cellular / WiFi ⇔ Cellular / LAN ⇔ WiFi / WiFi ⇔ LAN Gateway – allowing local systems, communicating over LAN and/or WiFi, to gain WAN access to the Internet. The WAN can be implemented using cellular modem / WiFi / LAN. A user configurable parameter allows the WAN to be configured to one of the iChip network interfaces. This mode includes a DHCP server and NAT to support multiple local systems communicating over a single cellular link.



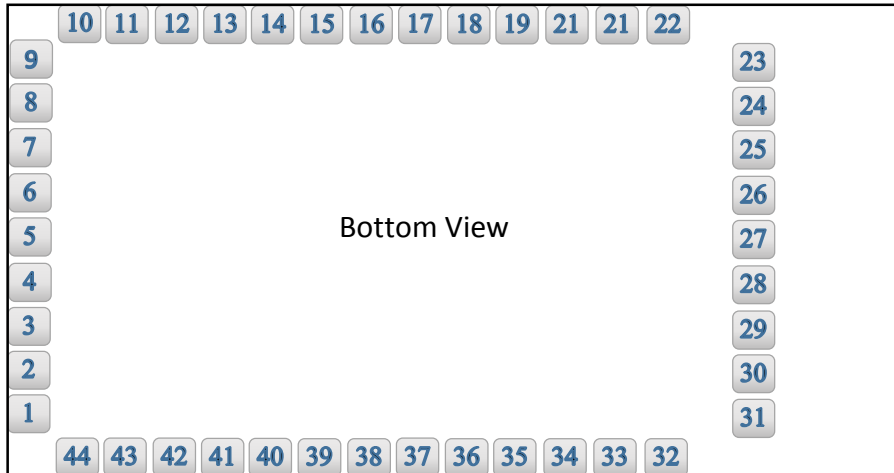
4. AT+i Command Set

The iW-SMG2SMT is configured and controlled using proprietary AT+i protocol. You can create a quick configuration using our AT+i Configuration Wizard located in Connect One's website <http://www.connectone.com>. In addition, the AT+i Programmer's Manual includes commands description and format of the entire AT+i command set.

Please refer to Appendix B for examples of module configuration using AT+i command set.

5. Layout and Pin Description

1) Layout



2) Pin Functional Description

| Pin | Signal | Type | Description |
|-----|----------|--------|--|
| 1 | GND | Power | |
| 2 | HDM | Analog | USB Host negative |
| 3 | HDP | Analog | USB Host positive |
| 4 | nRESET | Input | Reset Module. Pull LOW for 100mSec to Reset |
| 5 | PIOC4 | I/O | General In/Output Port |
| 6 | MSEL | Input | Mode select. Used for inducing rescue mode and forced local FW-update. |
| 7 | DATA_RDY | Output | Data ready. Signals incoming Internet data. |
| 8 | ETX_EN | Output | RMII Transmit Enable |
| 9 | REFCLK | Input | RMII Reference Clock 50Mhz |
| 10 | ETX0 | Output | RMII transmit Data 0 |
| 11 | ETX1 | Output | RMII transmit Data 1 |
| 12 | CRSDV | Input | RMII Carrier sense and Data Valid |
| 13 | ERX0 | Input | RMII Receive Data 0 |
| 14 | ERX1 | Input | RMII Receive Data 1 |

| | | | |
|-------|-----------|--------|---|
| 15 | ERXER | Input | RMII Receive Error |
| 16 | EMDC | Output | Management data Clock |
| 17 | EMDIO | I/O | Management data I/O |
| 18 | PIOC5 | I/O | General In/Output Port |
| 19 | VBUS | Output | VBUS for USB Host |
| 20 | Readiness | Output | iChip Ready status line. See AT+I programmers manual. |
| 21 | PIOC3 | I/O | General In/Output Port |
| 22 | VDD | Power | 3.3V |
| 23-31 | GND | Power | |
| 32 | nRF_LED | Output | RF LED indicator |
| 33 | ACH | Input | Analog Input |
| 34 | SPI1_CLK | Input | SPI 1 clock for host (Max 12MHz) |
| 35 | nSPI1_CS | Input | SPI 1 chip select for host |
| 36 | SPI1_MISO | Output | SPI 1 slave out for host master in |
| 37 | SPI1_MOSI | Input | SPI 1 slave in for host master out |
| 38 | SPI1_INT | Output | SPI 1 have data on his buffer |
| 39 | TXD0 | Output | UART 0 transmit |
| 40 | RXD0 | Input | UART 0 receive |
| 41 | nCTS0 | Input | UART 0 clear to send |
| 42 | nRTS0 | Output | UART 0 request to send |
| 43 | DDM | Analog | USB device negative |
| 44 | DDP | Analog | USB device positive |

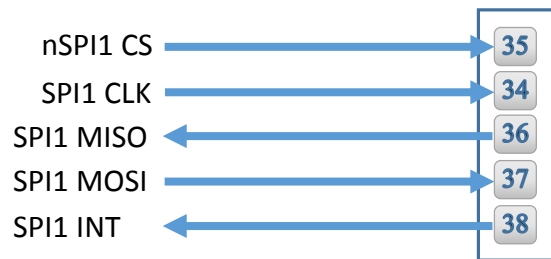
6. Interfaces

1) Serial Interface



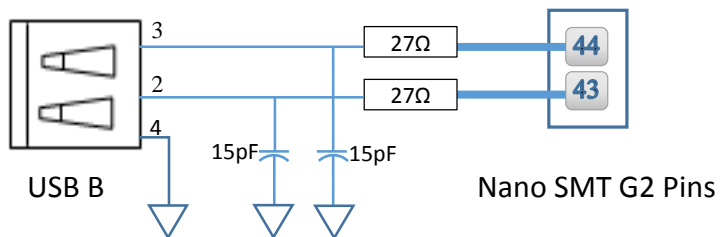
Nano SMT G2 Pins

2) SPI Interface

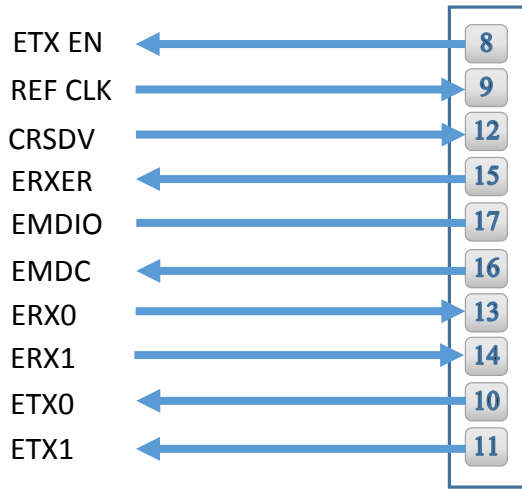


Nano SMT G2 Pins

3) USB 2.0 Device Interface

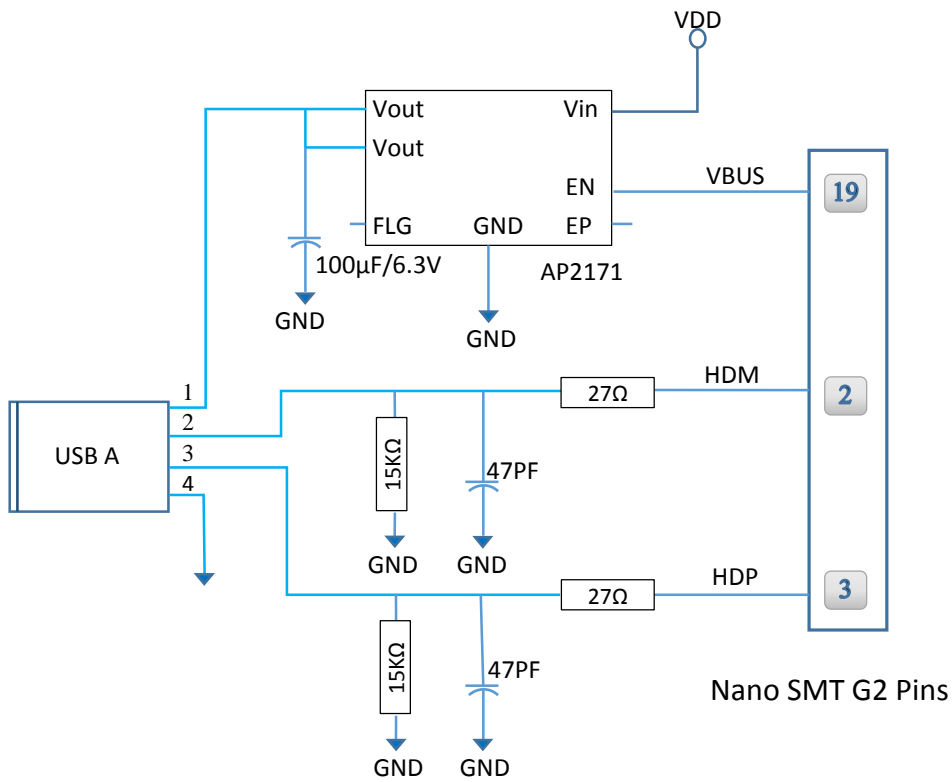


4) RMI Interface



Nano SMT G2 Pins

5) USB 2.0 Host Interface



Nano SMT G2 Pins

7. Electrical Specifications

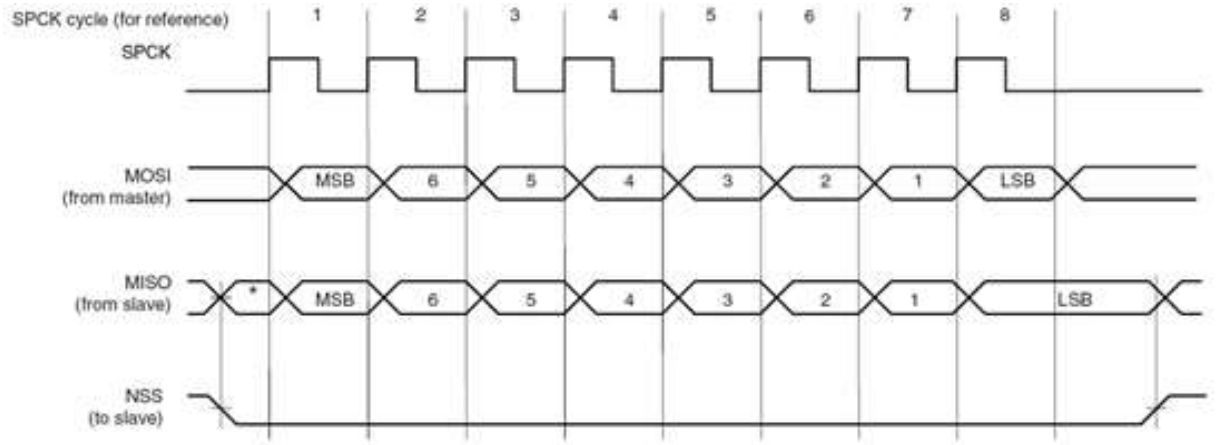
1) Absolute Maximum Ratings

| Parameter | Rating |
|---|-----------------------------------|
| Voltage at any pin with respect to ground | -0.3V to +3.6V |
| Operating Temperature | -30°C to +85°C -22°F to +185°F |
| Storage Temperature | -40°C to +85°C -40°F to +185°F |

2) DC Operating Characteristics

| Parameter | Min | Typical | Max | Units |
|---|--------------|---------|--------------|-------|
| VDD | 3.0 | 3.3 | 3.6 | Volts |
| High Level Input | 2.0 | | VDD I/O +0.3 | Volts |
| Low Level Input | -0.3 | | 0.8 | Volts |
| High Level Output @2mA | VDD I/O -0.4 | | | Volts |
| High Level Output @0mA | VDD I/O-0.2 | | | Volts |
| Low Level Output @2mA | | | 0.4 | Volts |
| Low Level Output @0mA | | | 0.2 | Volts |
| Input Leakage Current | | | 10 | μA |
| Power Supply Current from VDD (Tx. Mode) | | | 350 | mA |
| Power Supply Current from VDD (Rcv. Mode) | | | 130 | mA |
| Power Supply Current from VDD (Power Save Mode) | | | TBD | mA |
| Input Capacitance | | | 5.3 | pF |
| Radio Frequency Range | 2.412 | | 2.484 | GHz |

3) AC Operating Characteristics



4) Transmit Specification

| Item | Condition | Min | Typ | Max | Unit | |
|---------------------------------|-----------|------------|-----|-----|------|----|
| Transmit Power Levels | 802.11b | 15 | 17 | 19 | dBm | |
| | 802.11g | 12 | 14 | 16 | dBm | |
| | 802.11n | 10 | 12 | 14 | dBm | |
| Transmit Error vector Magnitude | 802.11b | 11Mbps | | -13 | -11 | dB |
| | | 1Mbps | | -13 | -11 | dB |
| | 802.11g | 54Mbps | | -30 | -25 | dB |
| | | 6Mbps | | -30 | -22 | dB |
| | 802.11n | HT20M@MCS0 | | -30 | -22 | dB |
| HT20M@MCS0 | | | -30 | -28 | dB | |

5) Receive Specifications

| Item | Condition | Min | Typ | Max | Unit |
|--|-------------------------------------|-----|-----|-----|------|
| Receiver Minimum Input Level Sensitivity | 802.11b Data Rate = 11Mbps PER < 8% | | -87 | -83 | dBm |
| | 802.11b Data Rate = 1Mbps PER < 8% | | -94 | -89 | dBm |
| | 802.11g Data Rate = 54Mbps PER <10% | | -73 | -68 | dBm |
| | 802.11g Data Rate = 6Mbps PER <10% | | -86 | -81 | dBm |
| | 802.11n MCS0 PER <10% | | -86 | -81 | dBm |
| | 802.11n MCS7 PER <10% | | -70 | -65 | dBm |

6) On Board Antenna

Designed for 2.4Ghz Operation

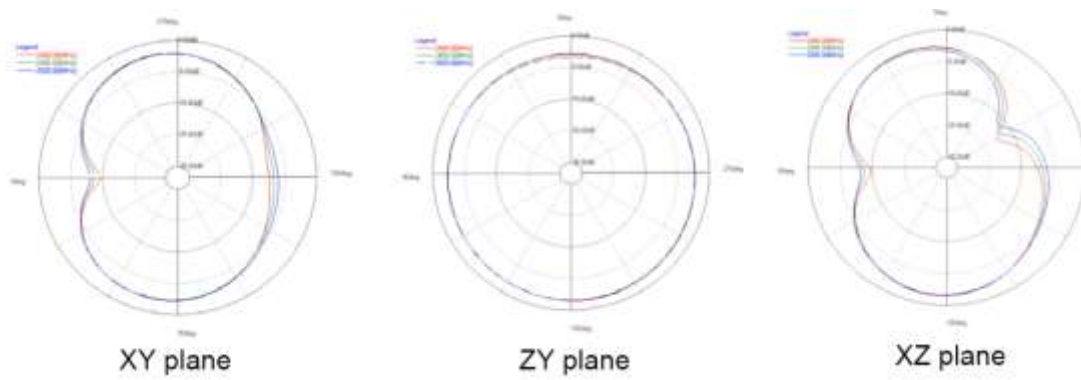
Peak Gain 2.1dBi

Average efficiency: 75%

Max Return Loss: -11dBi

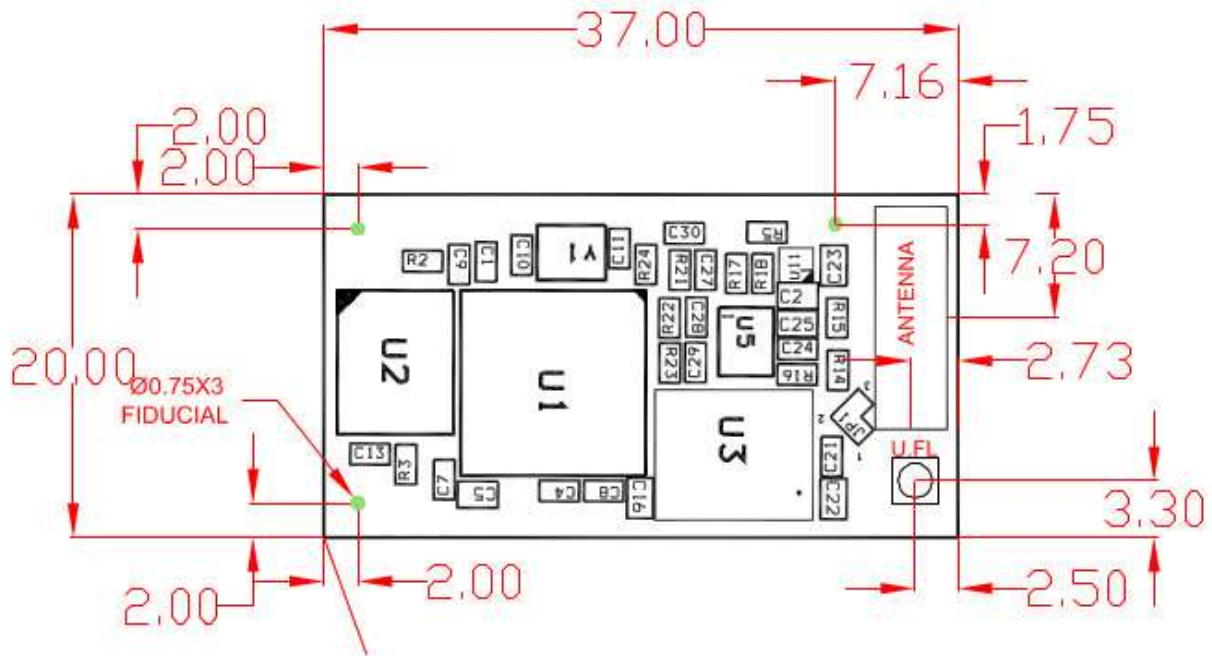
Max VSWR: 1, 8:1

Antenna Patterns

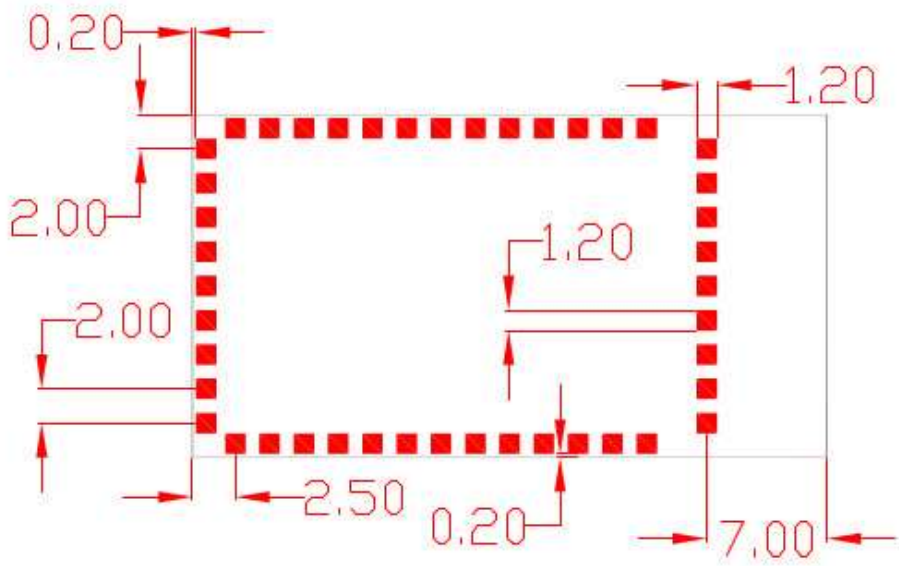


8. Mechanical Dimensions

UPPER VIEW



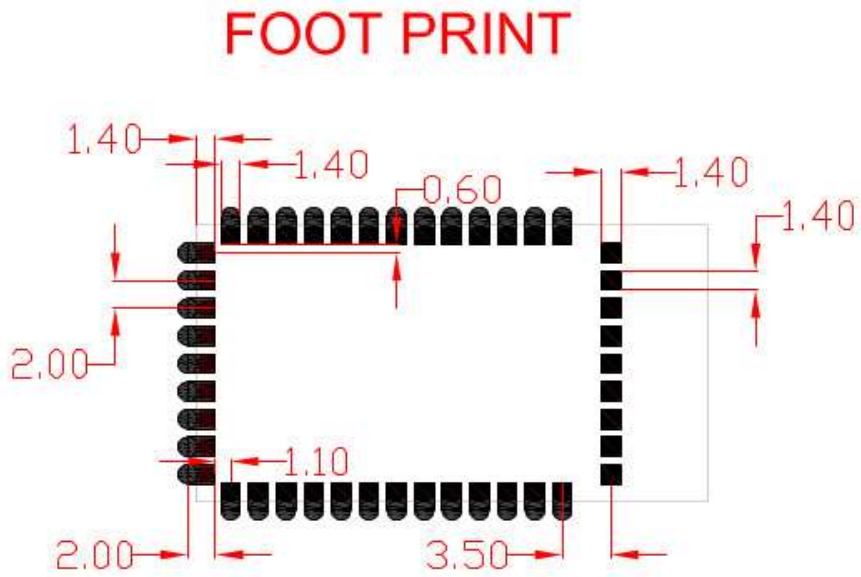
BOTTOM VIEW



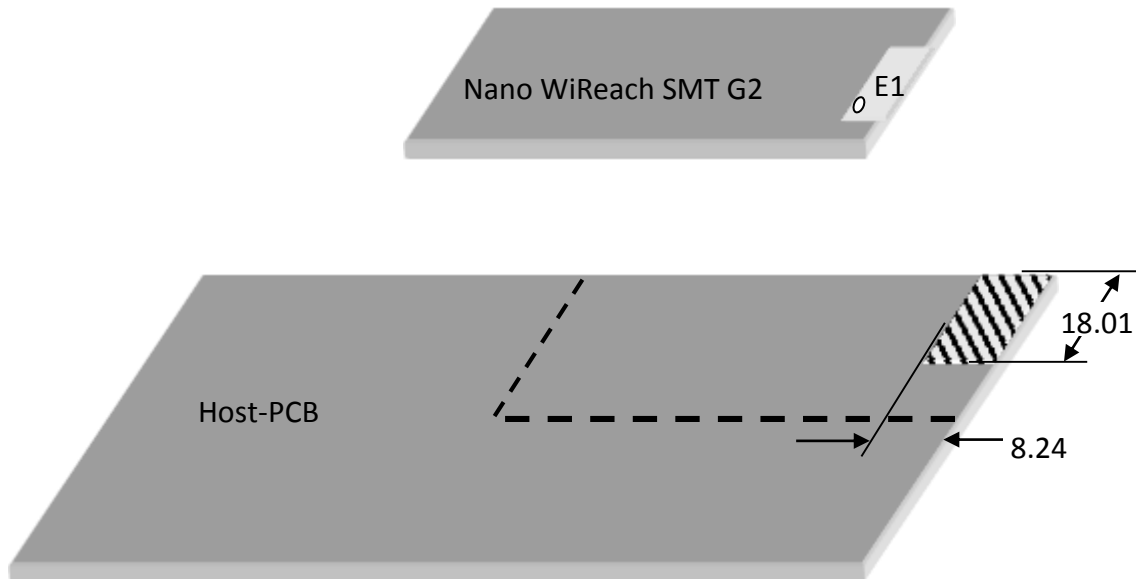
All measurements are in millimeters +/- 0.2mm

9. PCB Footprint Design Recommendation

1) Host PCB Footprint



2) Antenna Clearance Requirements



10. Evaluation Board

The EVMB evaluation kit with the EVM-iW-SMG2SMT-OB daughter board, enables you to evaluate the Nano WiReach SMT G2 without changing anything in your current development environment. Using a simple Windows-based application on a PC, you can issue AT+i commands.

AT+i commands are used to configure parameter values into iChip’s flash memory and activate Internet tasks such as email send, sockets, FTP sessions, configuration, and more.

A full description of AT+i commands can be found in the *AT+i Programmer’s Manual* on Connect One’s website.

To help you evaluate the Nano WiReach SMT G2, Connect One supplies the iChip Config Utility. This is a Windows-based application that contains intuitive dialog boxes to fully configure iChip CO2144. It doesn’t require any knowledge of AT+i commands. It also contains local firmware update tools. The iChip Config Utility allows you to perform specific Internet communication tasks such as sending and receiving emails, activating iChip’s websites, entering SerialNET mode, and more. The latest iChip Config Utility version and user manual can be found on Connect One’s website under the Support section.

On board connectors allow a choice of Host interfaces:

- RS232 COM port
- SPI
- USB Device

11. Ordering Information

| Part Number | Description |
|---------------|--|
| iW-SMG2SMT-EX | Nano WiReach SMT-G2 module, Surface Mounting, External Antenna |
| iW-SMG2SMT-OB | Nano WiReach SMT-G2 module, Surface Mounting, On Board Antenna |

Appendix A - Internet Protocol Compliance

Nano WiReach SMT G2 complies with the Internet standards listed in the following table

| | |
|-----------------|---|
| RFC 768 | User datagram protocol (UDP) |
| RFC 791 | Internet protocol (IP) |
| RFC 792 | ICMP – Internet control message protocol |
| RFC 793 | Transmission control protocol (TCP) |
| RFC 821 | Simple mail transfer protocol (SMTP) |
| RFC 822 | Standard for the format of ARPA Internet text messages |
| RFC 826 | Ethernet address resolution protocol (ARP) |
| RFC 959 | File transfer protocol (FTP) |
| RFC 854 | TELNET protocol specification |
| RFC 857 | Telnet ECHO option |
| RFC 858 | Telnet suppress go-ahead option |
| RFC 1034 | Domain names (DNS) - concepts and facilities |
| RFC 1035 | Domain names (DNS) - implementation and specification |
| RFC 1073 | Telnet window size option |
| RFC 1091 | Telnet terminal type option |
| RFC 1321 | MD5 message digest algorithm |
| RFC 1939 | Post office protocol - version 3 (POP3) |
| RFC 1957 | Some observations on the implementations of the post office protocol (POP3) |
| RFC 2030 | Simple network time protocol (SNTP) |
| RFC 2045 | Multipurpose Internet mail extensions (MIME) part one: internet message body format |
| RFC 2046 | MIME part two: media types |
| RFC 2047 | MIME part three: message header extensions for non-ASCII text |
| RFC 2048 | MIME part four: registration procedures |
| RFC 2049 | MIME part five: conformance criteria and examples |
| RFC 2068 | Hypertext transfer protocol HTTP/1.1 |
| RFC 2131 | Dynamic host configuration protocol (DHCP) |
| RFC 2132 | DHCP options (only relevant parts) |
| RFC 2228 | FTP security extensions |
| RFC 2246 | The TLS protocol version 1.0 |

Appendix B – AT+I Configuration Examples

Automatically connect to a specific Access Point:

| | |
|----------------------------|---|
| AT+iFD | (restore to factory defaults) |
| AT+iHIF=1 | (set the serial interface to RS232) |
| AT+iBDRF=9 | (fix baud rate to 115200 after power cycle) |
| AT+iRP20 | (list visible networks) |
| AT+iWLSI=My_WiFi | |
| AT+iWST0=4 | (WPA2 security) |
| AT+iWPP0=<WPA2 passphrase> | |
| AT+iAWS=1 | (enable website upon reboot) |
| AT+iDOWN | (reboot to apply settings) |

Create an Access Point to allow connection from mobile devices:

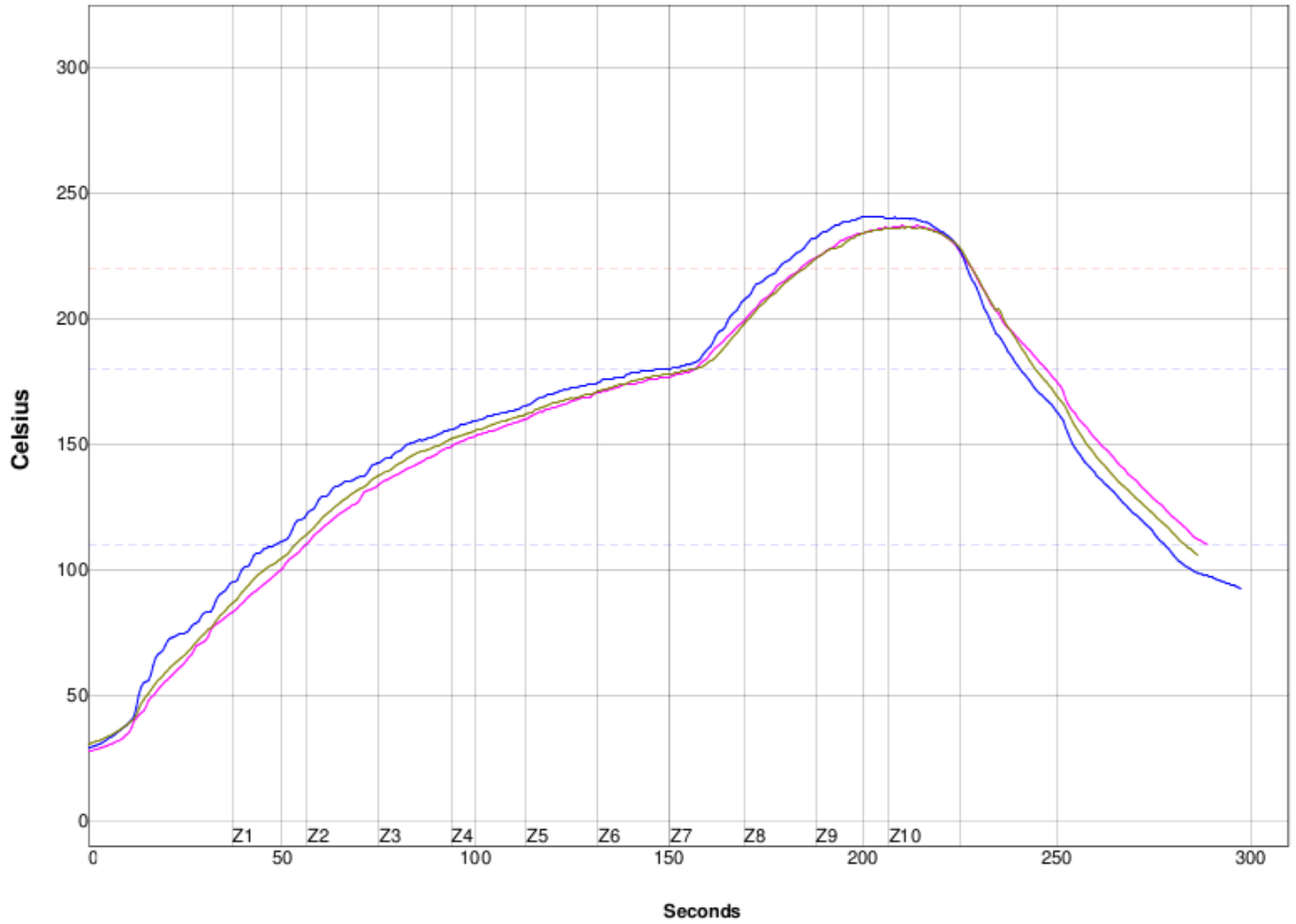
| | |
|------------------|--|
| AT+iFD | (restore to factory defaults) |
| AT+iHIF=1 | (set the serial interface to RS232) |
| AT+iBDRF=9 | (fix baud rate to 115200 after power cycle) |
| AT+iWLSI=My_AP | |
| AT+iDIP=10.0.0.1 | (IP address) |
| AT+iDPSZ=8 | (Enable internal DHCP server, up to 8 clients) |
| AT+iWST0=0 | (open security) |
| AT+iAWS=1 | (enable website upon reboot) |
| AT+iDOWN | (reboot to apply settings) |

LAN – WiFi switch mode - merges Ethernet station(s) with WiFi client(s) into one logical subnet

| | |
|------------------------|--|
| AT+iFD | (restore to factory defaults) |
| AT+iHIF=1 | (set the serial interface to RS232) |
| AT+iBDRF=9 | (fix baud rate to 115200 after power cycle) |
| AT+iwlsi=SWITCH | |
| AT+idpsz=8 | (Enable internal DHCP server, up to 8 clients) |
| AT+iwst0=0 | (open security) |
| AT+ilty=4 | (LAN type: WiFi+Ethernet) |
| AT+idip=192.168.0.1 | (WiFi side IP address) |
| AT+isnet=255.255.255.0 | (WiFi side subnet mask) |

| | |
|------------------------|-----------------------------|
| AT+iedip=192.168.0.100 | (Ethernet side IP address) |
| AT+iesnt=255.255.255.0 | (Ethernet side subnet mask) |
| AT+istap=1 | (WiFi in Access Point mode) |
| AT+iswen=1 | (Enable Switch Mode) |

Appendix C – Soldering Profile



Solder Paste: LEAD FREE

| Statistic Name | Low Limit | High Limit | Units |
|--|-----------|------------|-----------------|
| Max Rising Slope (Target=2.0) (Calculate Slope over 20 Seconds) | 0 | 4 | Degrees/Second |
| Soak Time 110-180C | 60 | 120 | Seconds |
| Time Above Reflow - 220C | 30 | 50 | Second |
| Peak Temperature | 235 | 250 | Degrees Celsius |