# *Specification*

# *MNX-92P2*

## Bluetooth® *Embedded Module*

# *With Antenna*

# *(Broadcom Based, Class 2)*

*Revision History*

| *Rev.* | *Date* | *Author* | *Reason for Changes* |
|---|---|---|---|
| 0.1 | Apr.1, 2009 | Jester Lee | ● First release |
| | | | |

# Table of Content

# Section 1: Overview

## INTRODUCTION

The MNX-92P2 is a Bluetooth® embedded module based on the BCM2046 Bluetooth 2.1 specification-compliant stand-alone baseband processor with an integrated 2.4 GHz transceiver. It is fully compliant with the Bluetooth radio specification and incorporates new modulation schemes to support enhanced data rates (EDRs) of 2 Mbps and 3 Mbps. The MNX-92P2 module supports both UART and Universal Serial Bus (USB) version 2.0 full-speed interfaces, and is fully compatible with the HCI interface specification. The module includes EEPROM, a crystal, and a Printed Circuit Board (PCB) antenna.

## *Features*

The module supports the following features:
• A Bluetooth 2.1 compliant embedded USB module with the following features:
- Secure Simple Pairing (SSP)
- Link Supervision Time Out (LSTO)
- Encryption Pause Resume (EPR)
- Enhance Inquiry Response (EIR)
- Sniff Subrating (SSR)
- Erroneous Data (ED)
- Packet Boundary Flag (PBF)
• A Programmable collaborative coexistence interface
• Class 1 output power capability
• Class 2 RF maximum output power specification of 4 dBm
• Full piconet and scatternet operation
• EDR rates of 2 MBps and 3 MBps
• A high-speed UART interface
• A USB 2.0 full-speed compliant interface
• Built-in Low Power Oscillator (LPO) clock or operation using an external LPO clock
• Full support for power-saving modes.
• Advanced Audio Distribution Profile (A2DP)
• Upgradeable firmware through an EEPROM download
• A PCB antenna

## *SUMMARY OF BENEFITS*

The MNX-92P2 delivers the following benefits:
• A complete Bluetooth system implementation with the addition of very few external components because of the high level of integration within the BCM2046.
• A high-performance PCB antenna that makes the MNX-92P2 module a complete Bluetooth system for a digital TV, set-top box, Blu-ray disc player, or other embedded application.
• Built-in firmware that adheres to the Bluetooth human interface device profile
The MNX-92P2 also comes with software support which includes:
• A firmware development kit
• A personal computer interface for product development

# APPLICATION EXAMPLES

Figure 1 showsexample Bluetooth applications for the MNX-92P2

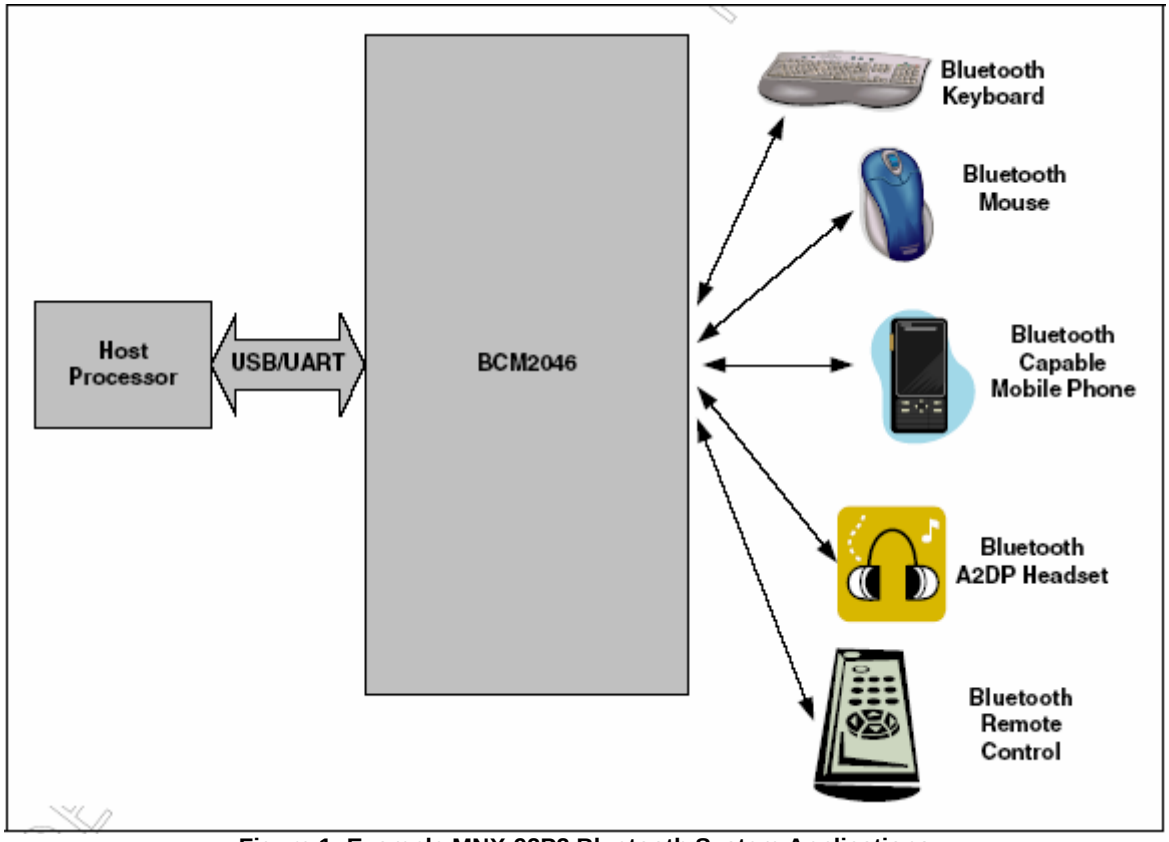


**Figure 1: Example MNX-92P2 Bluetooth System Applications**

# FUNCTIONAL DESCRIPTION

The primary component on the module is the Broadcom® BCM2046, which is a Bluetooth 2.1 compliant, single-chip device. The baseband and radio have been implemented in standard digital CMOS. The block diagram of the module is shown in Figure 2.

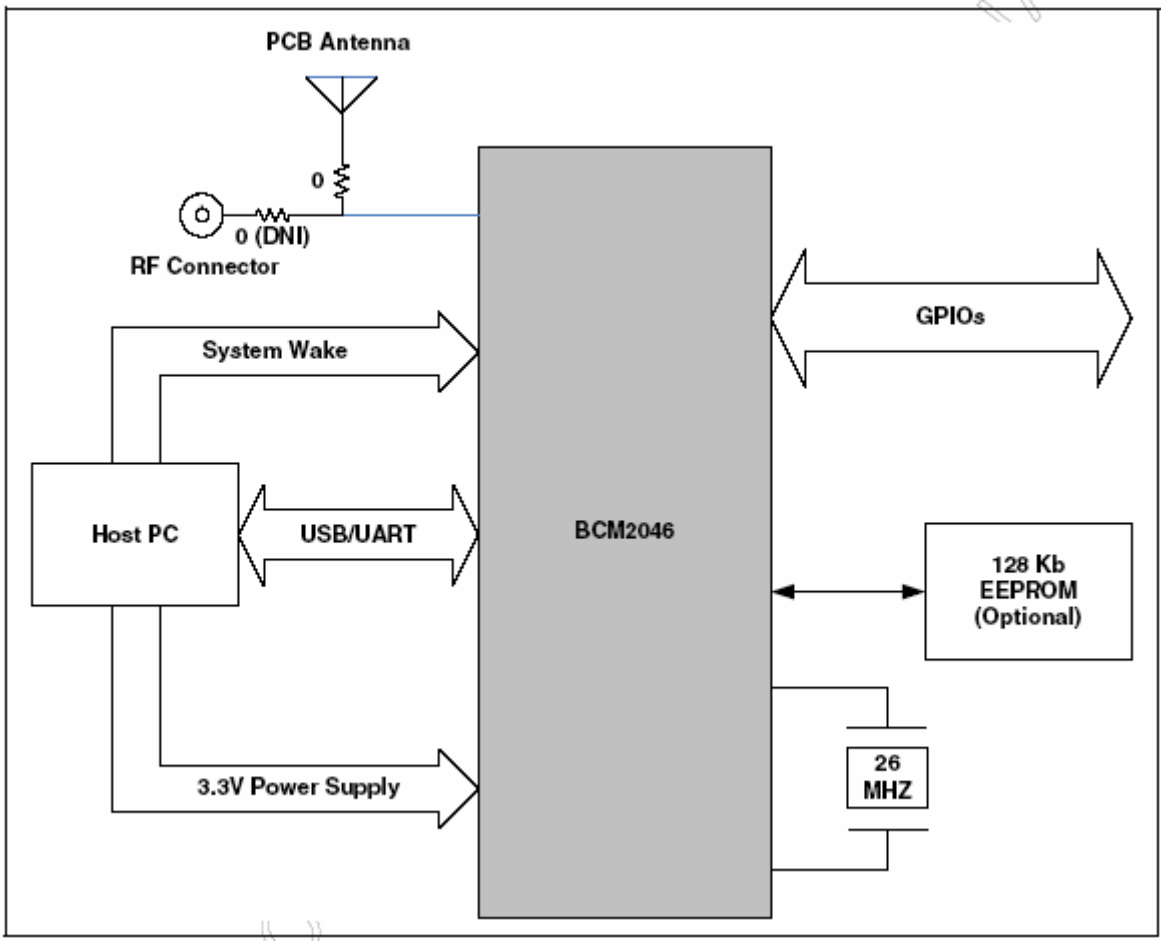


**Figure 2: MNX-92P2 Block Diagram**

The BCM2046 employs an integrated ARM7TDMIS™ 32-bit RISC processor with an embedded ICE-RT and JTAG interface unit. The microprocessor executes software in all layers from the link control layer to the HCI layer. The microprocessor includes 256 KB of program storage and boot code ROM and 48 KB of data scratchpad and patch code RAM. The BCM2046 baseband section performs all of the time critical functions required for high-performance Bluetooth operations.
The radio incorporates the complete receive and transmit paths, including the PLL, VCO, LNA, PA, upconverter, downconverter, modulator, demodulator, and channel select filtering.

# *PHYSICAL DESCRIPTION*

## MODULE PINOUT

The MNX-92P2 is a 27.6 mm × 14.6 mm FR4 PCB with a maximum thickness of 0.925 mm (36.4 mil) and 31 pads located around the perimeter. Figure 3 shows the module pinout diagram.

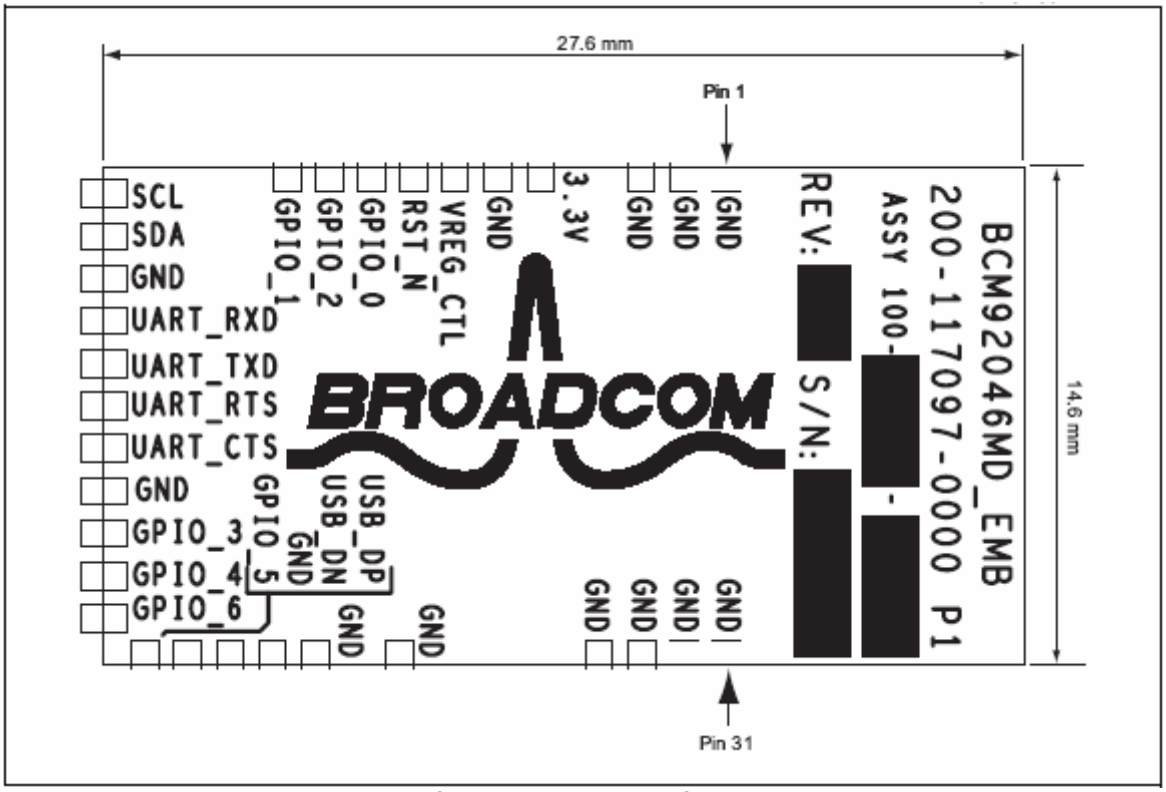


**Figure 3 : MNX-92P2 Pinout**

## MODULE PINOUT DESCRIPTION

Table 1 shows the MNX-92P2 pinout description.

| *Pin* | *Pin Name* | *I/O* | *Description* |
|---|---|---|---|
| 1, 2, 3, 5, 13, 18, 23, 26, 27, 28, 29, 30, 31 | GND | Power | System ground |
| 4 | 3.3V | Power | 3.3V power supply to the module |
| 6 | VREG_CTL | Input | Pre-regulator and VREG1 enable/disable control |
| 7 | RST_N | Input | Active low system reset |
| 8 | GPIO_0 | Input/ Output | GPIO |
| 9 | GPIO_2 | Input/ Output | GPIO |
| 10 | GPIO_1 | Input/ Output | GPIO |
| 11 | SCL | Input/ Output | Broadcom serial control clock ($I^2C$ compatible) |
| 12 | SDA | Input/ Output | Broadcom serial data ($I^2C$ compatible) |
| 14 | UART_RXD | Input | UART serial input |
| 15 | UART_TXD | Output | UART serial output |
| 16 | UART_RTS | Output | UART request to send |
| 17 | UART_CTS | Input | UART clear to send |
| 19 | GPIO_3 | Input/ Output | GPIO |
| 20 | GPIO_4 | Input/ Output | GPIO |
| 21 | GPIO_6 | Input/ Output | GPIO |
| 22 | GPIO_5 | Input/ Output | GPIO |
| 24 | USB_DN | Input/ Output | Downstream USB differential data |
| 25 | USB_DP | Input/ Output | Downstream USB differential data |

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# APPLICATION CODE

Application code resides in the on-module EEPROM. During power-on reset, the application code must be downloaded to BCM2046 RAM before the board performs any Bluetooth activity.
Application code can also be patched directly to BCM2046 RAM from the host during power-on reset without an external EEPROM.
The 2046 on-chip serial port can be used to download application code from a host computer file to EEPROM or on-chip RAM using either the UART or USB transport mechanisms.

# HARDWARE DESIGN CONSIDERATIONS

## EEPROM (OPTIONAL)

A 128-Kbit EEPROM is used to store application code and configuration information.

## CRYSTAL

The system design uses a 26 MHz crystal oscillator with an accuracy of ±8 ppm @25°C and ±12 ppm from –20°C to +70°C, a 50∧ maximum ESR, a 10 pF load capacitance, a 200 ⌈W (maximum) drive level and a ±1ppm/yr (maximum) aging rate.

## ANTENNA

A meander strip PCB antenna is placed on the reference board. The antenna is a variation of the printed F-antenna and has characteristics similar to those of the F-antenna.

## RF CONNECTOR

The MNX-92P2 has an optional RF connector, which is shown as J1 in Figure 4, that can be used in some applications to connect to an external antenna for better performance.
To use the optional RF connector, populate J1 and install RD1 at position B.

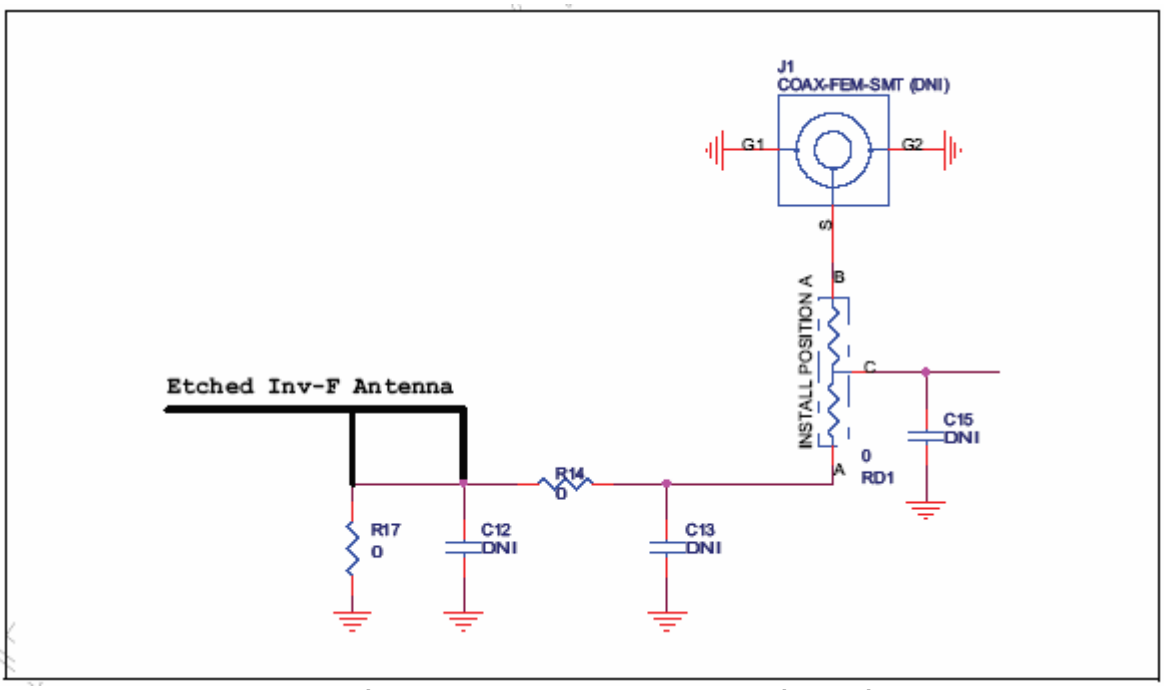


**Figure 4: MNX-92P2 Antenna Connection Option**

# Section 2: Supporting Documentation

MNX-92P2 schematic.

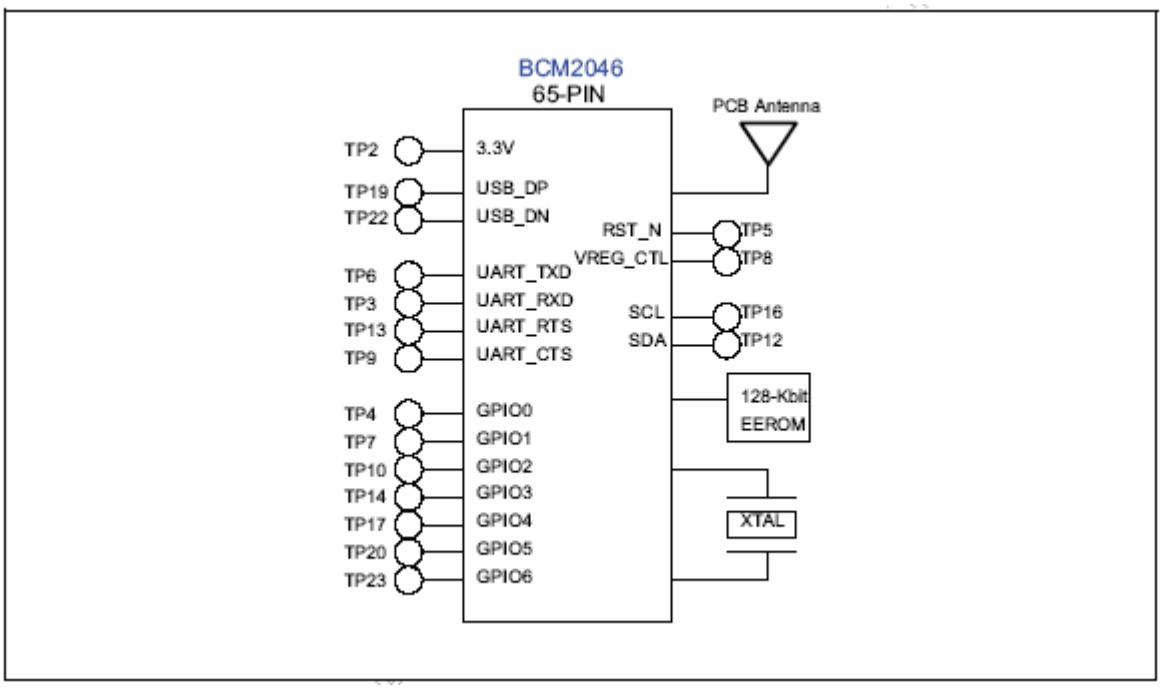


**Figure 5: MNX-92P2 Title Page (Page 1 of 2)**

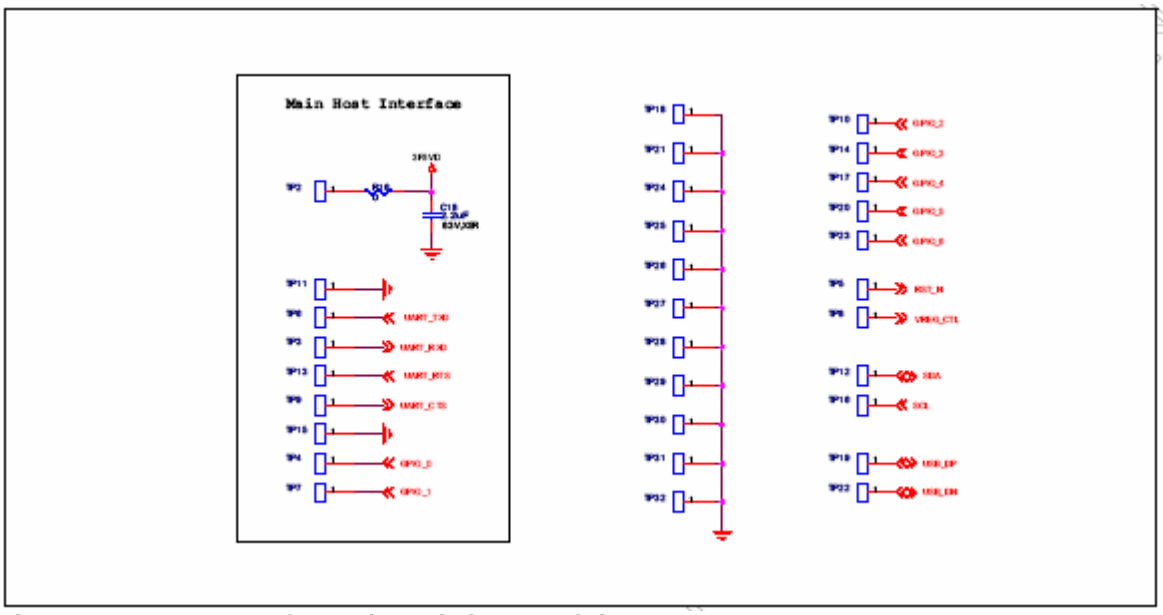


**Figure 8: MNX-92P2 Interface Schematic (Page 2 of 2)**

# USB/UART CONFIGURATIONS

## USB-ONLY CONFIGURATION

Do the following for the USB-only configuration:
• Install R1, R6, R7, R8 and do not install R2.
• Either pull up or float UART_CTS_N (pin C8). It is internally pulled up.
• Connect VDDUSB (pin G8), VBATT (pin A2), and VREG_CTL (pin B3) to the system 3.3V. If VREG_CTL is connected to a different power source, the delay between VREG_CTL and VBATT during power-up may cause a leakage current to flow through the USB_DN pad.

## UART-ONLY CONFIGURATION

Do the following for the UART-only configuration:
• Install R2 and do not install R1, R6, R7, R8.
• (Recommended) Ground VDD_USB (pin G8). USB_DP (pin H7) and USB_DN (pin J8) can be either grounded or left floating.

# PCB ANTENNA DESIGN CONSIDERATIONS

The following antenna design practices should be applied for optimal antenna performance:
• Do not place a copper plane underneath the antenna.
• Use a PCB edge to antenna clearing of at least one antenna trace width.
Figure 9 shows the MNX-92P2 antenna section.

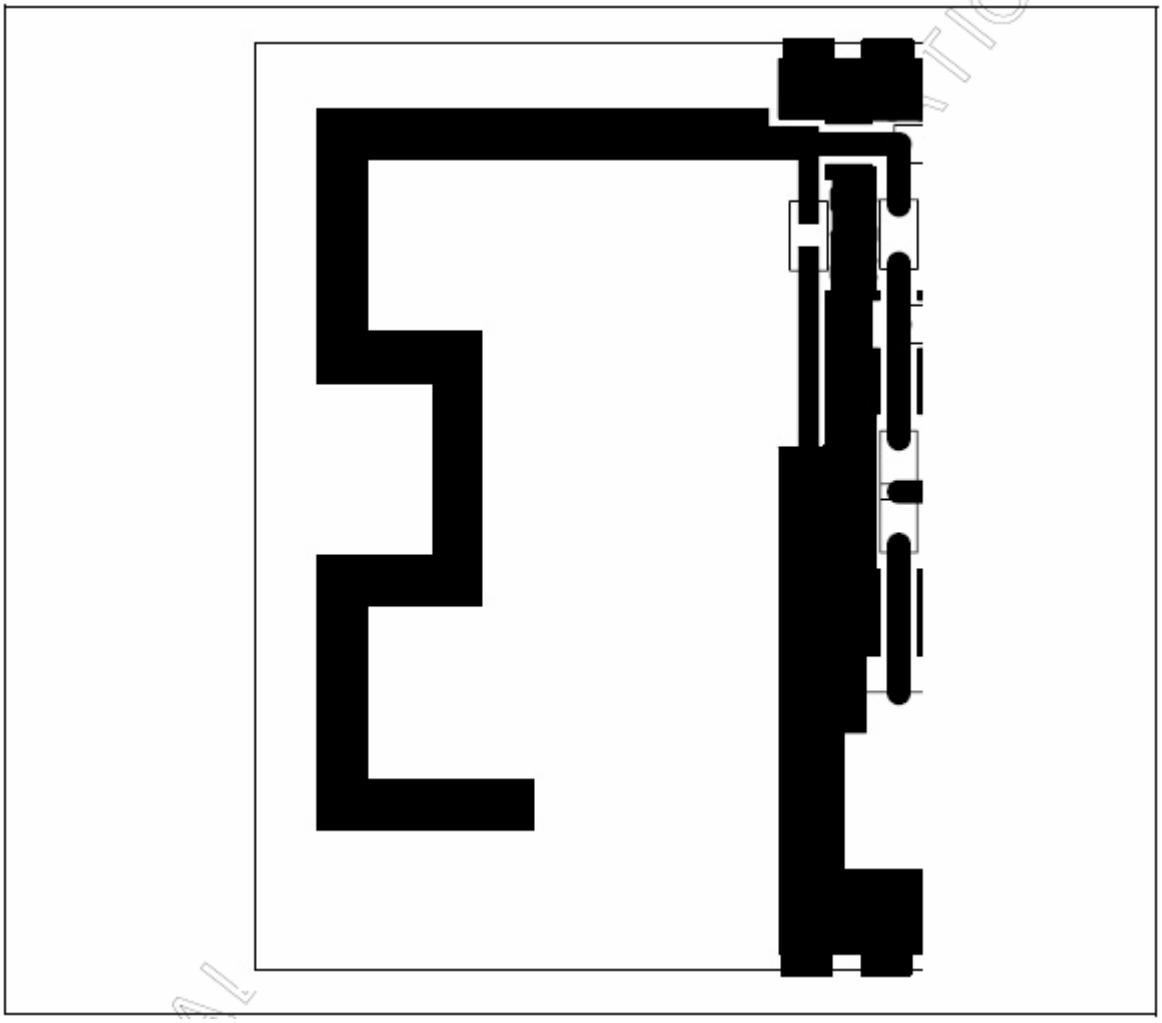

**Figure 9: MNX-92P2 Antenna**

# PCB LAYOUT

## COMPONENT PLACEMENT

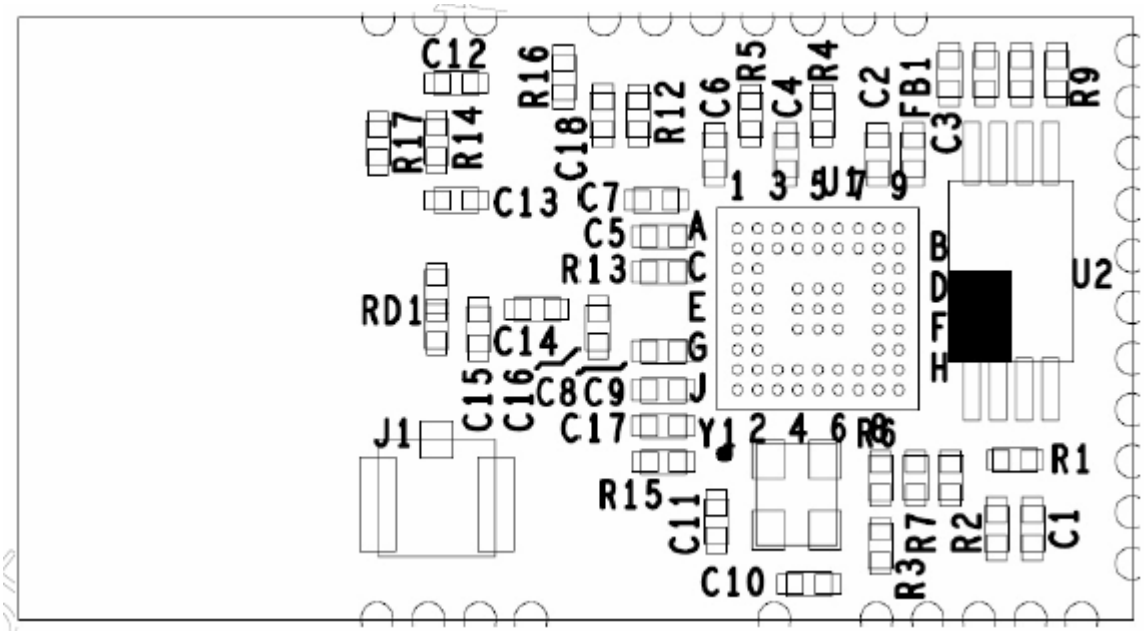


**Figure 11: MNX-92P2 Component Placement**

# MODULE RF SPECIFICATIONS AND MEASUREMENTS

Table 3, Table 4 on page 19, and Table 5 on page 21 show the Class 2 RF specifications and measurements as referenced to the module's RF input/output port without the PCB antenna (that is, all measurements are conducted not radiated).

**Table 3: Module Class 2 GFSK RF Specification (T = 25° C)**

| Specification | | | | Measurement Data | | | |
|---|---|---|---|---|---|---|---|
| *Parameter* | *Criteria* | *Minimum* | *Maximum* | *Frequency (MHz)* | *Measurement* | *Units* | *Conditions* |
| *Transmitter* | | | | | | | |
| Output power | – | –6 | 4 | 2402 | 1.84 (Pavg min.)<br>1.85 (Pavg max.)<br>2.09 (Peak) | dBm | • DH5 packet<br>• Hopping on<br>• Loopback<br>• Number of packets = 10 |
| | | | | 2441 | 1.44 (Pavg min.)<br>1.45 (Pavg max.)<br>1.77 (Peak) | | |
| | | | | 2480 | 0.61 (Pavg min.)<br>0.62 (Pavg max.)<br>1.03 (Peak) | | |
| Power density | – | – | 20 | – | .87 | dBm per 100 kHz EIRP | • DH5 packet<br>• Hopping off<br>• Loopback<br>• Number of packets = 10 |
| Tx output spectrum frequency range | – | 2400 | 2483.5 | 2402 | 2401.23 | MHz | • Payload = Tx<br>• DH1 packet<br>• PRBS9<br>• Tx power [dBm] = 1.00 |
| | | | | 2480 | 2480.7 | | |
| Tx output spectrum 20 dB bandwidth | – | 0 | 1 | 2402 | .92 | MHz | • DH5 packet<br>• Hopping off<br>• Loopback;<br>• Number of packets = 10 |
| | | | | 2441 | .92 | | |
| | | | | 2480 | .92 | | |
| Tx output spectrum, adjacent channel power | \|M-N\| = 2 | – | –20 | 2405 | –54.09 | dBm | • DH5<br>• Hopping Off<br>• Loopback<br>• Number of packets = 10 |
| | | | | 2441 | –54.32 | | |
| | | | | 2477 | –55.09 | | |
| | \|M-N\| ≥ 3 | – | –40 | 2405 | –56.96 | dBm | |
| | | | | 2441 | –49.38 | | |
| | | | | 2477 | –49.35 | | |
| | Exceptions | 0 | 3 | 2405 | 0 | – | |
| | | | | 2441 | 0 | | |
| | | | | 2477 | 0 | | |
| | Fails | 0 | 0 | 2405 | 0 | – | |
| | | | | 2441 | 0 | | |
| | | | | 2477 | 0 | | |

**Table 3: Module Class 2 GFSK RF Specification (T = 25° C)** (Cont.)

| Parameter | Specification Criteria | Minimum | Maximum | Measurement Data Frequency (MHz) | Measurement | Units | Conditions |
|---|---|---|---|---|---|---|---|
| Modulation | Delta f2max ≥ 99.9% of all delta f2max | 115 | – | 2402 | 132.8 | kHz | • DH5 Loopback<br>• Number of packets = 10<br>• Change payload = Toggle payload = Continue. |
| | | | | 2441 | 136 | | |
| | | | | 2480 | 139.1 | | |
| | Delta f1(Avg) | 140 | 175 | 2402 | 151.9 | kHz | |
| | | | | 2441 | 149.3 | | |
| | | | | 2480 | 148.1 | | |
| | Delta f2 / Delta f1 | 0.8 | – | 2402 | .94 | – | |
| | | | | 2441 | .98 | | |
| | | | | 2480 | 1.01 | | |
| Initial carrier frequency tolerance | | –75 | 75 | 2402 | –16.8 (Minimum)<br>–15.5 (Average)<br>–13.8 (Maximum) | kHz | • Hopping on<br>• Number of packets = 10<br>• Loopback |
| | | | | 2441 | –16.1 (Minimum)<br>–15.0 (Average)<br>–13.6 (Maximum) | kHz | |
| | | | | 2480 | –16.3 (Minimum)<br>–13.1 (Average)<br>–11.5 (Maximum) | kHz | |
| Carrier frequency drift | One slot packet drift [DH1] | –25 | 25 | 2402 | –6 | kHz | • DH1 and DH3 and DH5<br>• Hopping on<br>• Number of packets = 10<br>• Loopback |
| | | | | 2441 | –5 | | |
| | | | | 2480 | –6 | | |
| | Three slot packet drift [DH3] | –40 | 40 | 2402 | –6 | kHz | |
| | | | | 2441 | –6 | | |
| | | | | 2480 | –6 | | |
| | Five slot packet drift [DH5] | –40 | 40 | 2402 | –7 | kHz | |
| | | | | 2441 | –6 | | |
| | | | | 2480 | –6 | | |
| | Drift rate | – | – | 2402 | 5.33 | dB | |
| | | | | 2441 | –4.79 | | |
| | | | | 2480 | –6.03 | | |
| Receiver | | | | | | | |
| Sensitivity (BER) | –70 dBm, single-slot packets | – | 0.1 | 2402 | 0.00E+00 | BER | • Hopping off<br>• Number of packets = 740<br>• Payload = T<br>• Dirty TX = On<br>• Tx power = –70 dBm |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| | –70 dBm, multislot packets | – | 0.1 | 2402 | 0.00E+00 | BER | |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| CI performance | Number of fails | 0 | 0 | 2405 | 0 | – | • Payload = Tx<br>• DH1 packet<br>• PRBS9<br>• Tx power [dBm] = 1.00 |
| | | | | 2441 | 0 | | |
| | | | | 2477 | 0 | | |
| | Number of exceptions | 0 | 5 | 2405 | 0 | – | |
| | | | | 2441 | 0 | | |
| | | | | 2477 | 0 | | |

**Table 3: Module Class 2 GFSK RF Specification (T = 25° C)** (Cont.)

| Parameter | Specification Criteria | Minimum | Maximum | Measurement Data Frequency (MHz) | Measurement | Units | Conditions |
|---|---|---|---|---|---|---|---|
| Intermodulation performance | IP3+5 | – | 0.1 | 2402 | 0.00E+00 | BER | • DH5<br>• Hopping off<br>• Payload = Tx<br>• Dirty TX = Off |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| | IP3-5 | – | 0.1 | 2402 | 0.00E+00 | BER | |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| Maximum input level (BER) | At –20 dBm input | – | 0.1 | 2402 | 0.00E+00 | BER | • Payload = Tx<br>• Number of packets = 7408<br>• Tx power = –20 dBm |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| Single-Slot Sensitivity Level Search | | – | –70 | 2402 | –87.83 | dBm | • Hopping Off<br>• Number of packets = 7408<br>• Payload = Tx<br>• Dirty TX = On |
| | | | | 2441 | –88.59 | | |
| | | | | 2480 | –88.36 | | |

**Table 4: Module Class 2 EDR RF 2 MBPS Specification (T = 25° C)**

| Specification | | | | Measurement Data | | | |
|---|---|---|---|---|---|---|---|
| Parameter | Criteria | Minimum | Maximum | Freq. (MHz) | Measurement | Units | Conditions |
| **Transmitter** | | | | | | | |
| EDR relative transmit powers | EUT maximum relative transmit power | –4 | 1 | 2402 | .05 (Minimum)<br>.05 (Average)<br>.06 (Maximum) | dB | • 2-DH5<br>• Hopping off<br>• Loopback<br>• EUT maximum and minimum<br>• Number of packets = 10 |
| | | | | 2441 | .06 (Minimum)<br>.08 (Average)<br>.09 (Maximum) | dB | |
| | | | | 2480 | .08 (Minimum)<br>.10 (Average)<br>.11 (Maximum) | dB | |
| | EUT minimum relative transmit power | –4 | 1 | 2402 | .11 (Minimum)<br>.13 (Average)<br>.14 (Maximum) | dB | |
| | | | | 2441 | .18 (Minimum)<br>.19 (Average)<br>.20 (Maximum) | dB | |
| | | | | 2480 | .23 (Minimum)<br>.24 (Average)<br>.25 (Maximum) | dB | |
| EDR carrier frequency stability and modulation accuracy | 99% DEVM ≤ 0.30 | 99 | – | – | 100 (Minimum)<br>100 (Maximum) | % | • 2-DH5<br>• Hopping off<br>• Loopback<br>• Number of packets = 200 |
| | Peak DEVM | – | 0.35 | – | .11 (Minimum)<br>.15 (Maximum) | – | |
| | RMS DEVM | – | 0.2 | – | .48 (Minimum)<br>.68 (Maximum) | – | |
| | Initial frequency error | –75 | 75 | – | –16.8 (Minimum)<br>–13.4 (Maximum) | kHz | |
| | Frequency error | –10 | 10 | – | –1.3 (Minimum)<br>–1.0 (Maximum) | kHz | |
| | Block frequency error | –75 | 75 | – | –17.3 (Minimum)<br>–13.8 (Maximum) | kHz | |
| EDR differential phase encoding | % Good Packets | 99 | – | 2402 | 100 | % | • 2-DH1<br>• Hopping off<br>• Number of packets = 100 |
| | | | | 2441 | 100 | % | |
| | | | | 2480 | 100 | % | |
| EDR in-band spurious emission | Number of fails | 0 | 0 | 2405 | 0 | – | • 2-DH5<br>• Hopping off<br>• Loopback<br>• EUT maximum |
| | | | | 2441 | 0 | – | |
| | | | | 2477 | 0 | – | |
| | Number of exceptions | 0 | 3 | 2405 | 0 | – | |
| | | | | 2441 | 0 | – | |
| | | | | 2477 | 0 | – | |
| **Receiver** | | | | | | | |
| EDR sensitivity (BER) | 1.6e6 payload bits @ –70 dBm | – | .00007 | 2402 | 0.00E+00 | BER | • 2-DH5<br>• Hopping off<br>• Payload = Tx<br>• Dirty TX = On<br>• Tx power = –70 dBm |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| | 16e6 payload bits @ –70 dBm, if a failure occurs in the first 1.6e6 bits | – | .0001 | 2402 | – | BER | |
| | | | | 2441 | – | | |
| | | | | 2480 | – | | |
| Receive sensitivity level search | EDR receiver 0.0001 BER sensitivity Level | – | –70 | 2402 | –90 | dBm | • 2-DH5<br>• Hopping off<br>• Payload = Tx<br>• Dirty TX = On |
| | | | | 2441 | –90 | | |
| | | | | 2480 | –90 | | |

**Table 4: Module Class 2 EDR RF 2 MBPS Specification (T = 25° C)** (Cont.)

| Specification | | | | Measurement Data | | | |
|---|---|---|---|---|---|---|---|
| Parameter | Criteria | Minimum | Maximum | Freq. (MHz) | Measurement | Units | Conditions |
| EDR BER floor | 8e6 payload bits @ –60 dBm | – | .000007 | 2402 | 0.00E+00 | BER | • 2-DH5<br>• Hopping off<br>• Payload = Tx<br>• Dirty TX = Off<br>• Tx power = –60 dBm |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| | 160e6 payload bits @ –60 dBm, if a failure occurs in the first 8e6 bits | – | .00001 | 2402 | – | BER | |
| | | | | 2441 | – | | |
| | | | | 2480 | – | | |
| EDR C/I performance | Number of fails | 0 | 0 | 2405 | 0 | – | • 3-DH5<br>• Hopping Off<br>• Payload = Tx<br>• Dirty TX = Off |
| | | | | 2441 | 0 | – | |
| | | | | 2477 | 0 | – | |
| | Number of exceptions | 0 | 5 | 2405 | 0 | – | |
| | | | | 2441 | 0 | – | |
| | | | | 2477 | 0 | – | |
| EDR maximum input level | 1.6e6 payload bits @ –20 dBm | – | .001 | 2402 | 0.00E+00 | BER | • 2-DH5<br>• Hopping off<br>• Payload = Tx<br>• Tx power = –20 dBm |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |

**Table 5: Module Class 2 EDR RF 3MBPS Specification (T = 25° C)**

| Specification | | | | Measurement Data | | | |
|---|---|---|---|---|---|---|---|
| Parameter | Criteria or Condition | Minimum | Maximum | Freq. (MHz) | Measurement | Units | Conditions |
| Transmitter | | | | | | | |
| EDR relative transmit powers | EUT maximum relative transmit power | –4 | 1 | 2402 | .04 (Minimum)<br>.05(Average)<br>.06 (Maximum) | dB | • 3-DH5; Hopping off; Loopback; EUT maximum and minimum<br>• Number of packets = 10 |
| | | | | 2441 | .05 (Minimum)<br>.06 (Average)<br>.07 (Maximum) | dB | |
| | | | | 2480 | .08 (Minimum)<br>.10 (Average)<br>.10 (Maximum) | dB | |
| | EUT minimum relative transmit power | –4 | 1 | 2402 | .10 (Minimum)<br>.12 (Average)<br>.14 (Maximum) | dB | |
| | | | | 2441 | .14 (Minimum)<br>.14 (Average)<br>.16(Maximum) | dB | |
| | | | | 2480 | .17 (Minimum)<br>.19 (Average)<br>.20(Maximum) | dB | |
| EDR carrier frequency stability and modulation accuracy | 99% DEVM ≤ 0.30 | 99 | – | – | 100 (Minimum)<br>100(Maximum) | % | • 3-DH5<br>• Hopping off<br>• Loopback<br>• Number of packets = 200 |
| | Peak DEVM | – | 0.25 | – | .13 (Minimum)<br>.17 (Maximum) | – | |
| | RMS DEVM | – | 0.13 | – | .05 (Minimum)<br>.067 (Maximum) | – | |
| | Initial frequency error | –75 | 75 | – | –17.1 (Minimum)<br>–13.0 (Maximum) | kHz | |
| | Frequency error | –10 | 10 | – | –1.7 (Minimum)<br>–1.2 (Maximum) | kHz | |
| | Block frequency error | –75 | 75 | – | –17.6 (Minimum)<br>–13.9(Maximum) | kHz | |
| EDR differential phase encoding | % Good Packets | 99 | – | 2402 | 100 | % | • 3-DH1<br>• Hopping Off<br>• Number of packets = 100 |
| | | | | 2441 | 100 | % | |
| | | | | 2480 | 100 | % | |
| EDR in-band spurious emission | Number of fails | 0 | 0 | 2405 | 0 | – | • 3-DH5<br>• Hopping off<br>• Loopback<br>• EUT maximum |
| | | | | 2441 | 0 | – | |
| | | | | 2477 | 0 | – | |
| | Number of exceptions | 0 | 3 | 2405 | 0 | – | |
| | | | | 2441 | 0 | – | |
| | | | | 2477 | 0 | – | |
| Receiver | | | | | | | |
| EDR sensitivity (BER) | 1.6e6 payload bits @ –70 dBm | – | .00007 | 2402 | 0.00E+00 | BER | • 3-DH5<br>• Hopping off<br>• Payload = Tx<br>• Dirty TX = On<br>• Tx power = –70 dBm |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| | 16e6 payload bits @ –70 dBm, if a failure occurs in the first 1.6e6 bits | – | .0001 | 2402 | – | BER | |
| | | | | 2441 | – | | |
| | | | | 2480 | – | | |
| Receive sensitivity level search | EDR receiver 0.0001 BER sensitivity level | – | –70 | 2402 | –84.32 | dBm | • 3-DH5<br>• Hopping off<br>• Payload = Tx<br>• Dirty TX = On |
| | | | | 2441 | –84.49 | | |
| | | | | 2480 | –84.26 | | |

**Table 5: Module Class 2 EDR RF 3MBPS Specification (T = 25° C)** (Cont.)

| Specification | | | | Measurement Data | | | |
|---|---|---|---|---|---|---|---|
| Parameter | Criteria or Condition | Minimum | Maximum | Freq. (MHz) | Measurement | Units | Conditions |
| EDR BER floor | 8e6 payload bits @ –60 dBm | – | .000007 | 2402 | 0.00E+00 | BER | • 3-DH5<br>• Hopping off<br>• Payload = Tx<br>• Dirty TX = Off<br>• T x power = –60 dBm |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |
| | 160e6 payload bits @ –60 dBm, if a failure occurs in the first 8e6 bits | – | .00001 | 2402 | – | BER | |
| | | | | 2441 | – | | |
| | | | | 2480 | – | | |
| EDR C/I performance | Number of fails | 0 | 0 | 2405 | 0 | – | • 2-DH5<br>• Hopping off<br>• Payload = Tx<br>• Dirty TX = Off |
| | | | | 2441 | 0 | – | |
| | | | | 2477 | 0 | – | |
| | Number of exceptions | 0 | 5 | 2405 | 0 | – | |
| | | | | 2441 | 0 | – | |
| | | | | 2477 | 0 | – | |
| EDR maximum input level | 1.6e6 payload bits @ –20 dBm | – | .001 | 2402 | 0.00E+00 | BER | • 3-DH5<br>• Hopping off<br>• Payload = Tx<br>• Tx power = –20 dBm |
| | | | | 2441 | 0.00E+00 | | |
| | | | | 2480 | 0.00E+00 | | |