BLM Intentional Emitter Block Diagram and Description
October 18, 2002

Overview

The BLM series instrumentation modules utilize an integrated frequency hopping spread spectrum transceiver module operating in the ISM band from 2.4 to 2.4835 GHz. The commercial trade name used to identify the function characteristics of the communication format is Bluetooth RF Specification version 1.1.

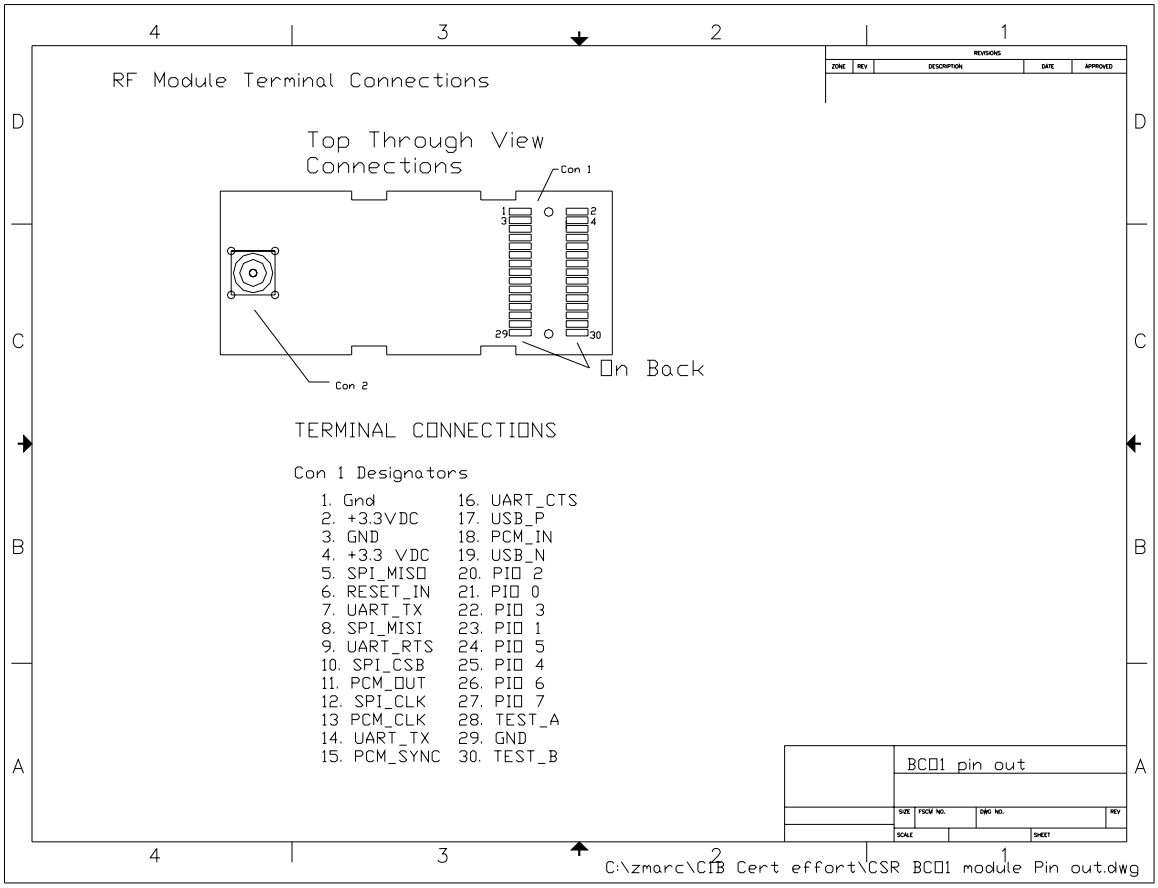
The functional characteristics of the Bluetooth standard define the maximum data rate to be 1 Mbit/s with a hopping rate of 1600 channels/s. The operating band is channalized into 79 one megahertz wide channels starting at 2.402 and ending at 2.480 megahertz. The transmit power is limited by design to 50 milli-Watts maximum and is controlled to minimize the total transmit power to maintain a pre-defined link quality. The modulation format is GFSK (Gaussian Frequency Shift Keying) with a BT product of .5 and a deviation between 145 and 175 kHz.

The hopping sequence is determined by a platform unique kernel based on an IEEE issuing system of device identifiers. The system utilized IEEE is designed to ensure each transceiver platform has a worldwide unique identifier number used to define the starting point in a Bluetooth copyrighted pseudorandom number that repeats every 23.302 hours from the time the unit was turned on. The kernel chosen to define the offset in the pseudorandom number sequence is derived from a set of numbers that uniquely identify each and every module. As a consequence of utilizing a unique number, no coordination of frequency hopping between transceivers is possible. Each transceiver's receiver must coordinate itself with the desired transceiver's transmitted hopping sequence to demodulate the transmitted symbols.

Mechanical configuration

The module is approximately 1.9 inches long, .75 inches wide and .14 inches high. (See Appendix A) for drawings. The unit has an integrated shield system that encloses all the electronic devices in a Gaussian surface comprised of a rectangular sheet metal can on the top surface of the printed wiring board. Conductive vies connect through the printed wiring board down to a copper ground plane on the reverse side of the printed wiring board. There are Two connectors on the board. One of the connectors is Data and power connections. (See Appendix A). The second connector is a unique coaxial radio frequency type that is a reversed sex version of the SMA type. This will eliminate the possibility a user could purchase an antenna intended for celluar or other applications and apply it to the BLX devices.

Appendix A


RF Module Terminal Connections
Top Through View
Connections
Con 1
Con 2
On Back
TERMINAL CONNECTIONS
Con 1 Designators
1. Gnd
2. +3.3VDC
3. GND
4. +3.3 VDC
5. SPI_MIS
6. RESET_IN
7. UART_TX
8. SPI_MISI
9. UART_RTS
10. SPI_CSB
11. PCM_OUT
12. SPI_CLK
13 PCM_CLK
14. UART_TX
15. PCM_SYNC
16. UART_CTS
17. USB_P
18. PCM_IN
19. USB_N
20. PI 2
21. PI 0
22. PI 3
23. PI 1
24. PI 5
25. PI 4
26. PI 6
27. PI 7
28. TEST_A
29. GND
30. TEST_B
BC01 pin out
C:\zmarc\CIB Cert effort\CSR BC01 module Pin out.dwg