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## VMX-100-SPP Preliminary Datasheet

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### General Description

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The VMX-100-SPP is a 2.4 GHz Bluetooth radio (or modem) that acts as a wireless transceiver. Integrating the VMX-100-SPP into a device and setting up Bluetooth serial communication enables that device to send and receive wireless communication to/from other Bluetooth-enabled devices.

### Features

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- **Small Size:** The VMX-100 Wireless Modem has been engineered to be a very small size - only 1.44" x 1.335".
- **Simple Integration:** Using VMX-100 Wireless Modems eliminates the need for expensive RF engineering and development for your product.
- **Fast Time to Market:** Using the VMX-100 Wireless Modem reduces the time to market for your wireless product.
- **Highly Customizable:** VPrf.com gives you the flexibility you need for your specific application by offering wireless radio customization and integration services.
- **Extended Range:** VMX-100 Wireless Modems transmit and receive Bluetooth signals up to 100 meters (328 feet) with embedded antennas.
- **Low Power Consumption:** Power management becomes easier with the low power consumption of the VMX-100 Wireless Modem.

### Applications

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- Consumer Products
- Medical Devices
- Industrial Products
- Handheld Devices
- Military Devices
- Government Applications

### Ordering Information

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| Part Number        | Description                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VMX-100-SPP        | Bluetooth Modem with embedded Serial Port Profile and integrated PCB antenna.                                                                                                                               |
| VMX-Evaluation Kit | Evaluation kit for VMX Bluetooth Modems. Includes one VMX-100-SPP module, one VMX-RS232 Interface Adapter, one Bluetooth USB Adapter, one 9-pin RS232 serial cable, one AC power adapter, and instructions. |

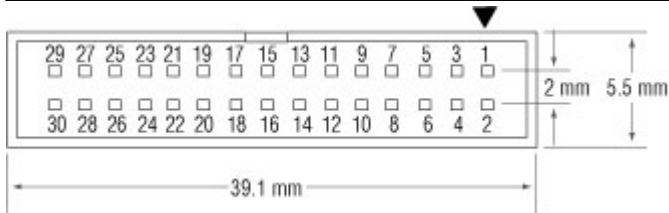


## Key Specifications

| General Specifications        |                                                          |                                                                                        |
|-------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------|
|                               | Board Size with Connector                                | 1.44" x 1.335" x 0.385" (36.58mm x 33.91mm x 9.78mm)                                   |
|                               | Weight                                                   | 0.3 oz.                                                                                |
|                               | Frequency                                                | 2.4 GHZ - ISM band                                                                     |
|                               | Bluetooth Class                                          | Class I                                                                                |
|                               | Emission Type                                            | Frequency hopping spread spectrum (FHSS GFSK)                                          |
|                               | RF Data Rate                                             | 1 Mbps                                                                                 |
|                               | Data Throughput                                          | 723 kbps maximum                                                                       |
|                               | Connector                                                | 30 pins, 2 rows, 2 mm pin spacing                                                      |
|                               | Operating Temperatures                                   | 0° to 70° C (commercial)                                                               |
| Antenna                       |                                                          |                                                                                        |
|                               | Internal                                                 | Embedded antenna                                                                       |
|                               | External                                                 | Connector for external antenna*<br><small>*May require additional FCC testing.</small> |
| Power Requirements            |                                                          |                                                                                        |
|                               | Supply Voltage                                           | 3.3 - 5 volts unregulated                                                              |
|                               | Transmit Current                                         | 125 mA                                                                                 |
|                               | Receive Current                                          | 60 mA                                                                                  |
|                               | Sleep Mode Current                                       | 100 µA                                                                                 |
|                               | Shutdown Mode Current                                    | 0.1 µA                                                                                 |
|                               | Transmit Power Output                                    | 100 mW maximum (20 dBm)                                                                |
|                               | Max. Sleep Time to Maintain Sync                         | 1.28 seconds recommended                                                               |
| Compatibility & Certification |                                                          |                                                                                        |
|                               | FCC                                                      | FCC Modular Approval                                                                   |
|                               | Bluetooth                                                | Bluetooth 1.1 Compatible                                                               |
| Distance                      |                                                          |                                                                                        |
|                               | Range                                                    | 100 m (330 feet) open range                                                            |
| Interface                     |                                                          |                                                                                        |
|                               | 30 Pin Interface                                         | UART, USB, and audio interfaces (standard)                                             |
| Power Consumption             |                                                          |                                                                                        |
|                               | ACL Data Transfer<br>720kbps USB (Slave)                 | 140 mA                                                                                 |
|                               | ACL Connection, Sniff Mode, 40ms Interval, 38.4kbps UART | 10 mA                                                                                  |
|                               | ACL connection, Sniff Mode 1.28s interval, 38.4kbps UART | 2 mA                                                                                   |



## Pin Diagram



## Pin Description

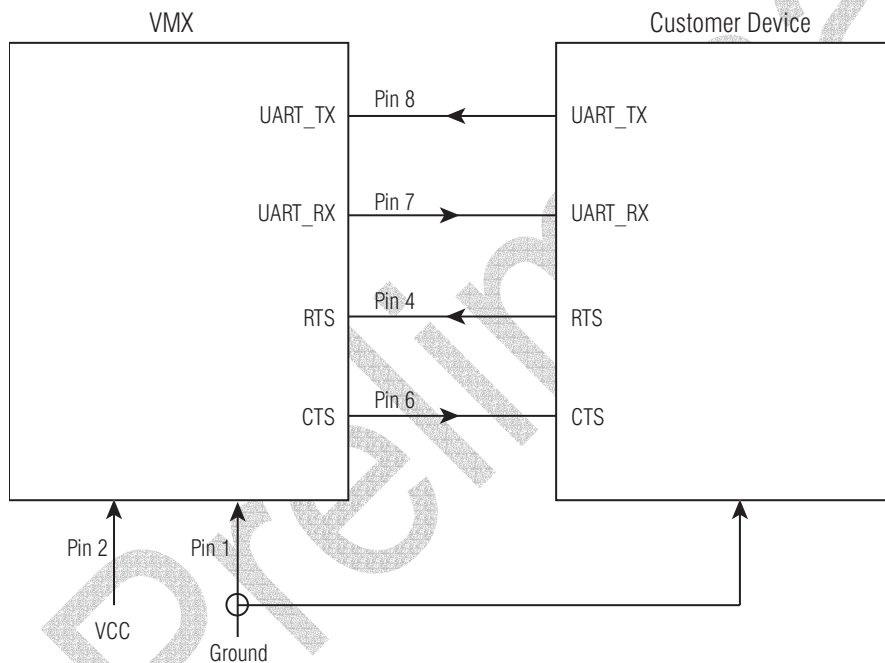
| Pin Number | Name        | Description/Function                                                 |
|------------|-------------|----------------------------------------------------------------------|
| 1          | GND         | Ground                                                               |
| 2          | VCC         | 3.3V to 5.5V unregulated power supply                                |
| 3          | RESET(L)    | Reset if low - must be low for >5ms                                  |
| 4          | UART_CTS(L) | UART clear to send input - active low - connect to your RTS output   |
| 5          | GND         | Ground                                                               |
| 6          | UART_RTS(L) | UART request to send output - active low - connect to your CTS input |
| 7          | UART_TX     | UART data output to your device's RX                                 |
| 8          | UART_RX     | UART data input to your device's TX                                  |
| 9          | GPIO_1      | VPrf programmable input/output line                                  |
| 10         | SHUTDOWN(L) | Power shutdown to entire module - active low                         |
| 11         | SPI_MISO    | Serial peripheral interface data output                              |
| 12         | GPIO_2      | VPrf programmable input/output line                                  |
| 13         | GND         | Ground                                                               |
| 14         | SPI_CSB     | Chip select for serial peripheral interface                          |
| 15         | USB_D+      | USB data plus                                                        |
| 16         | USB_D-      | USB data minus                                                       |
| 17         | SPI_MOSI    | Serial peripheral interface data input                               |
| 18         | GND         | Ground                                                               |
| 19         | GPIO_3      | VPrf programmable input/output line                                  |
| 20         | SPI_CLK     | Serial peripheral interface clock                                    |
| 21         | PCM_SYNC    | Audio synchronous data SYNC                                          |
| 22         | PCM_IN      | Audio synchronous data input                                         |
| 23         | PCM_CLK     | Audio synchronous data                                               |



|    |         |                                       |
|----|---------|---------------------------------------|
| 24 | PCM_OUT | Audio synchronous data                |
| 25 | GPIO_4  | VPrf programmable input/output line   |
| 26 | GND     | Ground                                |
| 27 | GPIO_5  | VPrf programmable input/output line   |
| 28 | GPIO_6  | VPrf programmable input/output line   |
| 29 | VCC     | 3.3V to 5.5V unregulated power supply |
| 30 | GND     | Ground                                |

(L) – Indicates an active low signal

## Wiring Diagram





## Electrical Characteristics

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| Parameter               | Minimum | Typical | Maximum |
|-------------------------|---------|---------|---------|
| Absolute Maximum VCC    |         |         | 5.5V    |
| Absolute Minimum VCC    | 3.15V   |         |         |
| Input Logic Level Low   | -0.4V   |         | 0.8V    |
| Input Logic Level High  | 2.1V    |         | 3.4V    |
| Output Logic Level Low  |         |         | 0.2V    |
| Output Logic Level High | 2.8V    |         |         |

## Default UART Settings

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| Parameter             | Setting |
|-----------------------|---------|
| Baud Rate             | 57,600  |
| Data Bits             | 8       |
| Parity                | None    |
| Stop Bits             | 1       |
| Hardware Flow Control | Enabled |

