

## Hexa-Band Wireless Digital Data Link

The all new pMDDL1624 is a miniature OEM, high power, Hexa-Band wireless OEM solution that provides the throughput and range needed for complex data intensive applications. The pMDDL1624 offers software selectable operation in the 1.6, 1.8, 2.0, 2.2, 2.3 or 2.4 GHz frequency ranges. The Pico MIMO DDL features 2x2 MIMO Digital Data Link, using Maximal Ratio Combining (MRC), Maximal Likelihood (ML) decoding and Low-Density Parity Check (LDPC) to achieve robust RF performance. The pMDDL1624 features secure and simultaneous Ethernet and Serial Data Communications.

**2X2 MIMO**

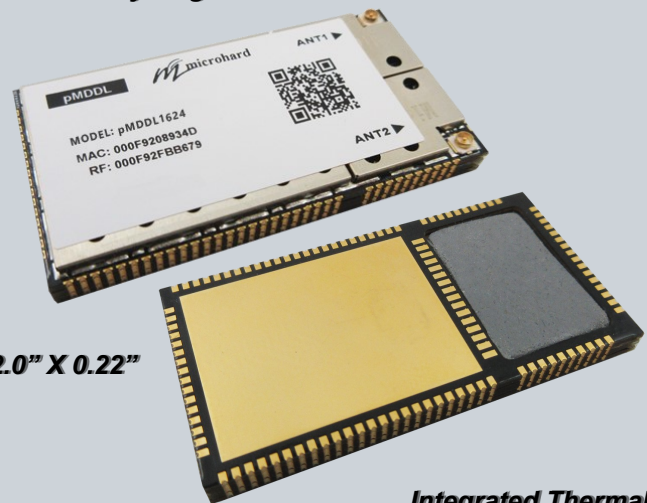
**Up to 21 Mbps**

**Hexa-Band**

**Ethernet + Serial**

**PTP | PMP | Relay | MESH**

**Only 15 grams!**



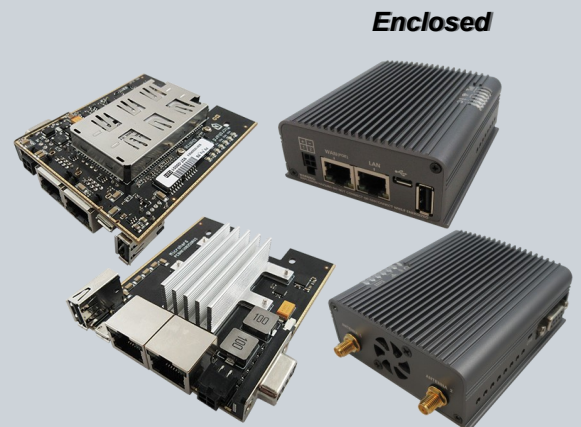
**1.05" X 2.0" X 0.22"**

**Integrated Thermal Pad!**

## pMDDL1624 Features

- Software Selectable 1.6, 1.8, 2.0, 2.2, 2.3 or 2.4 GHz Operation
- Maximal Ratio Combining (MRC), Maximal Likelihood (ML) decoding
- Low-Density Parity Check (LDPC)
- FIPS140-2 Compliant
- Up to 21 Mbps Iperf Throughput @ 8 MHz channel (-78 dBm)  
Up to 2 Mbps IPerf Throughput @ 4 MHz channel (-102 dBm)
- Extremely small foot print and very lightweight
- Serial Communication Port
- Dual 10/100 Ethernet Ports (LAN/WAN)
- Supports Point-to-Point, Point-to-Multipoint & MESH Networks
- Master, Remote, Relay & MESH Operating Modes.
- Adjustable total transmit power (up to 1W)
- Interface through local console, telnet, and web browser
- Local and remote wireless firmware upgrading through FTP

## Interface Options



**Enclosed**

**Motherboard**

## Optimal Performance Specifications

| Modulation                             | MIMO ON                 |                               |                         |                               |                        | MIMO OFF                |                               |                         |                               |                        |
|--|-------------------------|-------------------------------|-------------------------|-------------------------------|------------------------|-------------------------|-------------------------------|-------------------------|-------------------------------|------------------------|
|  | 8MHZ Channel            |                               | 4MHZ Channel            |                               | Total Tx Power +/- 1dB | 8MHZ Channel            |                               | 4MHZ Channel            |                               | Total Tx Power +/- 1dB |
|  | IPerf Throughput (Mbps) | Optimal MRC Sensitivity (dBm) | IPerf Throughput (Mbps) | Optimal MRC Sensitivity (dBm) |                        | IPerf Throughput (Mbps) | Optimal MRC Sensitivity (dBm) | IPerf Throughput (Mbps) | Optimal MRC Sensitivity (dBm) |                        |
| <b>Frequency Band: 1625 - 1725 MHz</b> |                         |                               |                         |                               |                        |                         |                               |                         |                               |                        |
| BPSK_1/2                               | 3.1                     | -99.5                         | 1.57                    | -102.5                        | 30dBm                  | 3.1                     | -96.5                         | 1.57                    | -99.5                         | 30dBm                  |
| QPSK_1/2                               | 6.0                     | -98                           | 3.0                     | -101                          | 30dBm                  | 6.0                     | -95                           | 3.0                     | -98                           | 30dBm                  |
| QPSK_3/4                               | 8.4                     | -96                           | 4.3                     | -99                           | 30dBm                  | 8.4                     | -93                           | 4.3                     | -96                           | 30dBm                  |
| 16QAM_1/2                              | 10.7                    | -92                           | 5.4                     | -95.5                         | 30dBm                  | 10.7                    | -89                           | 5.4                     | -92.5                         | 30dBm                  |
| 16QAM_3/4                              | 14.8                    | -90                           | 7.4                     | -93                           | 30dBm                  | 14.8                    | -87                           | 7.4                     | -90                           | 30dBm                  |
| 64QAM_2/3                              | 18.1                    | -85                           | 7.8                     | -88                           | 30dBm                  | 18.1                    | -82                           | 7.8                     | -85                           | 30dBm                  |
| 64QAM_3/4                              | 19.0                    | -83.5                         | 8.0                     | -86                           | 30dBm                  | 19.0                    | -80.5                         | 8.0                     | -83                           | 30dBm                  |
| 64QAM_5/6                              | 21.0                    | -81                           | 10.0                    | -83.5                         | 30dBm                  | 21.0                    | -78                           | 10.0                    | -80.5                         | 30dBm                  |
| <b>Frequency Band: 1780 - 1850 MHz</b> |                         |                               |                         |                               |                        |                         |                               |                         |                               |                        |
| BPSK_1/2                               | 3.1                     | -99.5                         | 1.57                    | -102.5                        | 30dBm                  | 3.1                     | -96.5                         | 1.57                    | -99.5                         | 30dBm                  |
| QPSK_1/2                               | 6.0                     | -98                           | 3.0                     | -101                          | 30dBm                  | 6.0                     | -95                           | 3.0                     | -98                           | 30dBm                  |
| QPSK_3/4                               | 8.4                     | -96                           | 4.3                     | -99                           | 30dBm                  | 8.4                     | -93                           | 4.3                     | -96                           | 30dBm                  |
| 16QAM_1/2                              | 10.7                    | -92                           | 5.4                     | -95.5                         | 30dBm                  | 10.7                    | -89                           | 5.4                     | -92.5                         | 30dBm                  |
| 16QAM_3/4                              | 14.8                    | -90                           | 7.4                     | -93                           | 30dBm                  | 14.8                    | -87                           | 7.4                     | -90                           | 30dBm                  |
| 64QAM_2/3                              | 18.1                    | -85                           | 7.8                     | -88                           | 30dBm                  | 18.1                    | -82                           | 7.8                     | -85                           | 30dBm                  |
| 64QAM_3/4                              | 19.0                    | -83.5                         | 8.0                     | -86                           | 30dBm                  | 19.0                    | -80.5                         | 8.0                     | -83                           | 30dBm                  |
| 64QAM_5/6                              | 21.0                    | -81                           | 10.0                    | -83.5                         | 30dBm                  | 21.0                    | -78                           | 10.0                    | -80.5                         | 30dBm                  |
| <b>Frequency Band: 2020 - 2110 MHz</b> |                         |                               |                         |                               |                        |                         |                               |                         |                               |                        |
| BPSK_1/2                               | 3.1                     | -99.5                         | 1.57                    | -102.5                        | 30dBm                  | 3.1                     | -96.5                         | 1.57                    | -99.5                         | 30dBm                  |
| QPSK_1/2                               | 6.0                     | -98                           | 3.0                     | -101                          | 30dBm                  | 6.0                     | -95                           | 3.0                     | -98                           | 30dBm                  |
| QPSK_3/4                               | 8.4                     | -96                           | 4.3                     | -99                           | 30dBm                  | 8.4                     | -93                           | 4.3                     | -96                           | 30dBm                  |
| 16QAM_1/2                              | 10.7                    | -92                           | 5.4                     | -95.5                         | 30dBm                  | 10.7                    | -89                           | 5.4                     | -92.5                         | 30dBm                  |
| 16QAM_3/4                              | 14.8                    | -90                           | 7.4                     | -93                           | 30dBm                  | 14.8                    | -87                           | 7.4                     | -90                           | 30dBm                  |
| 64QAM_2/3                              | 18.1                    | -85                           | 7.8                     | -88                           | 30dBm                  | 18.1                    | -82                           | 7.8                     | -85                           | 27dBm                  |
| 64QAM_3/4                              | 19.0                    | -83.5                         | 8.0                     | -86                           | 30dBm                  | 19.0                    | -80.5                         | 8.0                     | -83                           | 27dBm                  |
| 64QAM_5/6                              | 21.0                    | -81                           | 10.0                    | -83.5                         | 29dBm                  | 21.0                    | -78                           | 10.0                    | -80.5                         | 26dBm                  |
| <b>Frequency Band: 2200 - 2300 MHz</b> |                         |                               |                         |                               |                        |                         |                               |                         |                               |                        |
| BPSK_1/2                               | 3.1                     | -99.5*                        | 1.57                    | -102.5*                       | 30dBm                  | 3.1                     | -96.5*                        | 1.57                    | -99.5*                        | 30dBm                  |
| QPSK_1/2                               | 6.0                     | -98*                          | 3.0                     | -101*                         | 30dBm                  | 6.0                     | -95*                          | 3.0                     | -98*                          | 30dBm                  |
| QPSK_3/4                               | 8.4                     | -96*                          | 4.3                     | -99*                          | 30dBm                  | 8.4                     | -93*                          | 4.3                     | -96*                          | 30dBm                  |
| 16QAM_1/2                              | 10.7                    | -92*                          | 5.4                     | -95.5*                        | 30dBm                  | 10.7                    | -89*                          | 5.4                     | -92.5*                        | 28dBm                  |
| 16QAM_3/4                              | 14.8                    | -90*                          | 7.4                     | -93*                          | 30dBm                  | 14.8                    | -87*                          | 7.4                     | -90*                          | 28dBm                  |
| 64QAM_2/3                              | 18.1                    | -85*                          | 7.8                     | -88*                          | 28dBm                  | 18.1                    | -82*                          | 7.8                     | -85*                          | 25dBm                  |
| 64QAM_3/4                              | 19.0                    | -83.5*                        | 8.0                     | -86*                          | 28dBm                  | 19.0                    | -80.5*                        | 8.0                     | -83*                          | 25dBm                  |
| 64QAM_5/6                              | 21.0                    | -81*                          | 10.0                    | -83.5*                        | 27dBm                  | 21.0                    | -78*                          | 10.0                    | -80.5*                        | 24dBm                  |
| <b>Frequency Band: 2300 - 2390 MHz</b> |                         |                               |                         |                               |                        |                         |                               |                         |                               |                        |
| BPSK_1/2                               | 3.1                     | -99.5*                        | 1.57                    | -102.5*                       | 30dBm                  | 3.1                     | -96.5*                        | 1.57                    | -99.5*                        | 30dBm                  |
| QPSK_1/2                               | 6.0                     | -98*                          | 3.0                     | -101*                         | 30dBm                  | 6.0                     | -95*                          | 3.0                     | -98*                          | 30dBm                  |
| QPSK_3/4                               | 8.4                     | -96*                          | 4.3                     | -99*                          | 30dBm                  | 8.4                     | -93*                          | 4.3                     | -96*                          | 30dBm                  |
| 16QAM_1/2                              | 10.7                    | -92*                          | 5.4                     | -95.5*                        | 30dBm                  | 10.7                    | -89*                          | 5.4                     | -92.5*                        | 28dBm                  |
| 16QAM_3/4                              | 14.8                    | -90*                          | 7.4                     | -93*                          | 30dBm                  | 14.8                    | -87*                          | 7.4                     | -90*                          | 28dBm                  |
| 64QAM_2/3                              | 18.1                    | -85*                          | 7.8                     | -88*                          | 28dBm                  | 18.1                    | -82*                          | 7.8                     | -85*                          | 25dBm                  |
| 64QAM_3/4                              | 19.0                    | -83.5*                        | 8.0                     | -86*                          | 28dBm                  | 19.0                    | -80.5*                        | 8.0                     | -83*                          | 25dBm                  |
| 64QAM_5/6                              | 21.0                    | -81*                          | 10.0                    | -83.5*                        | 27dBm                  | 21.0                    | -78*                          | 10.0                    | -80.5*                        | 24dBm                  |
| <b>Frequency Band: 2400 - 2500 MHz</b> |                         |                               |                         |                               |                        |                         |                               |                         |                               |                        |
| BPSK_1/2                               | 3.1                     | -99.5*                        | 1.57                    | -102.5*                       | 30dBm                  | 3.1                     | -96.5*                        | 1.57                    | -99.5*                        | 30dBm                  |
| QPSK_1/2                               | 6.0                     | -98*                          | 3.0                     | -101*                         | 30dBm                  | 6.0                     | -95*                          | 3.0                     | -98*                          | 30dBm                  |
| QPSK_3/4                               | 8.4                     | -96*                          | 4.3                     | -99*                          | 30dBm                  | 8.4                     | -93*                          | 4.3                     | -96*                          | 30dBm                  |
| 16QAM_1/2                              | 10.7                    | -92*                          | 5.4                     | -95.5*                        | 30dBm                  | 10.7                    | -89*                          | 5.4                     | -92.5*                        | 28dBm                  |
| 16QAM_3/4                              | 14.8                    | -90*                          | 7.4                     | -93*                          | 30dBm                  | 14.8                    | -87*                          | 7.4                     | -90*                          | 28dBm                  |
| 64QAM_2/3                              | 18.1                    | -85*                          | 7.8                     | -88*                          | 28dBm                  | 18.1                    | -82*                          | 7.8                     | -85*                          | 25dBm                  |
| 64QAM_3/4                              | 19.0                    | -83.5*                        | 8.0                     | -86*                          | 28dBm                  | 19.0                    | -80.5*                        | 8.0                     | -83*                          | 25dBm                  |
| 64QAM_5/6                              | 21.0                    | -81*                          | 10.0                    | -83.5*                        | 27dBm                  | 21.0                    | -78*                          | 10.0                    | -80.5*                        | 24dBm                  |

**Notes:**

\* Rx Sensitivity for frequency bands starting at 2280 MHz and higher, subtract 1.5 ~ 3 dBm (-1.5 @ 2280 MHz, -2 @ 2290 MHz, -3 @ 2300 MHz)

# Specifications

|  |  |  |   |   |
|--|--|--|---|---|
| <b>Frequency<br/>(Software Selectable)</b>             | 1625 to 1725 MHz<br>1780 to 1850 MHz<br>2020 to 2110 MHz<br>2200 to 2300 MHz<br>2300 to 2390 MHz<br>2400 to 2500 MHz                                 | <b>Weight</b>                            | OEM Enclosed  | Approx. 15 grams<br>Approx. 275 grams   |
|  |  | <b>Dimensions</b>                        | OEM Enclosed  | Approx. 1.05" x 2.0" x .22"<br>(26.5mm x 51mm x 5.6mm)<br>Approx. 3.20" x 3.50" x 1.35"<br>(81mm x 88mm x 35mm) |
| <b>Error Detection</b>                                 | 32 bits of CRC, ARQ  |  |   |   |
| <b>Encryption<br/>(Requires Export Permit)</b>         | 256-bit AES  | <b>Order Options</b>                     |   |   |
| <b>Ports</b><br>Serial Data/Console<br>Ethernet<br>USB | RS232 TTL level (300bps to 921kbps)<br>Dual 10/100 IEEE802.3 (LAN/WAN)<br>2.0  | <b>pMDDL1624</b><br><b>pMDDL1624-ENC</b> | 2X2 MIMO Hexa-Band OEM Data Link<br>2X2 MIMO Hexa-Band Enclosed Data Link |   |
| <b>Firewall</b>  | Port Forwarding, Access Control, IP/<br>MAC List.  |  |   |   |
| <b>Operating Modes</b>                                 | Point-to-Point, Point-to-Multipoint,<br>Repeater, Mesh   |  |   |   |
| <b>Diagnostics</b>                                     | Remote Diagnostics, Ping, Trac-<br>eroute, ARP table, DHCP active leas-<br>es, IPPerf, RSSI  |  |   |   |
| <b>Management</b>                                      | Local Serial Port Console, Telnet,<br>WebUI, SNMP, FTP Upgrade, TFTP,<br>CLI (Command Line Interface)  |  |   |   |
| <b>Rejection</b>                                       | Excellent strong signal interference &<br>rejection characteristics  |  |   |   |
| <b>Input Voltage</b>                                   | OEM Digital Voltage = 3.3V / RF Voltage =<br>5V  |  |   |   |
| <b>Connectors:</b>                                     | OEM Antenna: UFL x2 (ANT1, ANT2)<br>Data: 116 Pin SMT  |  |   |   |
|  | Enclosed Antenna: SMA Female x2<br>Data: RJ-45 x2 (Ethernet)<br>Female DB9 (Serial)<br>USB Type A<br>Micro-AB USB (Console)<br>4 PIN Interlock (Vin) |  |   |   |
| <b>Environmental</b><br>Temperature<br>Humidity        | -40°F to 185°F (-40°C to +85°C)<br>5-95%, non-condensing   |  |   |   |

## Contact Information

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Specifications subject to change without notice.

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