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| CLASSIFICATION UNCLASSIFIED | | PAGE of Pages | | | | | | | | | | | | | | | |
| TRANSMITTER EQUIPMENT CHARACTERISTICS | | | | | | | | | | | | | | | | | |
| 1. NOMENCLATURE, MANUFACTURER'S MODEL NO. n920F (Serial Version) IPn920F (Ethernet / USB Version) | 2. MANUFACTURER'S NAME Microhard Systems Inc. | | | | | | | | | | | | | | | | |
| 3. TRANSMITTER INSTALLATION | 4. TRANSMITTER TYPE FM | | | | | | | | | | | | | | | | |
| 5. TUNING RANGE 902.4 to 927.6 MHz | 6. METHOD OF TUNING Synthesis PLL | | | | | | | | | | | | | | | | |
| 7. RF CHANNELING CAPABILITY 250kHz or 280kHz @ 230.4kbps / 400kHz @ 345kbps | 8. EMISSION DESIGNATOR(S) FM Modulated 280kF1D @ 230kbps 480kF1D @ 345kbps | | | | | | | | | | | | | | | | |
| 9. FREQUENCY TOLERANCE 2.5 PPM | 12. EMISSION BANDWIDTH <i>(X and complete as applicable)</i> <div style="text-align: center;"> <input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">a. -3 dB</td> <td style="width: 33%;">180 kHz (230kbps)</td> <td style="width: 33%;">225kHz (345kbps)</td> </tr> <tr> <td>b. -20 dB</td> <td>280 kHz (230kbps)</td> <td>375kHz (345kbps)</td> </tr> <tr> <td>c. -40 dB</td> <td>550 kHz (230kbps)</td> <td>775kHz (345kbps)</td> </tr> <tr> <td>d. -60 dB</td> <td>950 kHz (230kbps)</td> <td>1.25MHz (345kbps)</td> </tr> <tr> <td>e. OC-BW</td> <td>290 kHz (230kbps)</td> <td>485kHz (345kbps)</td> </tr> </table> | | a. -3 dB | 180 kHz (230kbps) | 225kHz (345kbps) | b. -20 dB | 280 kHz (230kbps) | 375kHz (345kbps) | c. -40 dB | 550 kHz (230kbps) | 775kHz (345kbps) | d. -60 dB | 950 kHz (230kbps) | 1.25MHz (345kbps) | e. OC-BW | 290 kHz (230kbps) | 485kHz (345kbps) |
| a. -3 dB | | | 180 kHz (230kbps) | 225kHz (345kbps) | | | | | | | | | | | | | |
| b. -20 dB | | | 280 kHz (230kbps) | 375kHz (345kbps) | | | | | | | | | | | | | |
| c. -40 dB | 550 kHz (230kbps) | 775kHz (345kbps) | | | | | | | | | | | | | | | |
| d. -60 dB | 950 kHz (230kbps) | 1.25MHz (345kbps) | | | | | | | | | | | | | | | |
| e. OC-BW | 290 kHz (230kbps) | 485kHz (345kbps) | | | | | | | | | | | | | | | |
| 10. FILTER EMPLOYED <i>(X one)</i> <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO | | | | | | | | | | | | | | | | | |
| 11. SPREAD SPECTRUM <i>(X one)</i> <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO | 15. MAXIMUM MODULATION FREQUENCY 115.2 kHz | | | | | | | | | | | | | | | | |
| 13. MAXIMUM BIT RATE 230.4 kbps / 345 kbps –NT (option) | 17. DEVIATION RATIO 0.5 to 1 | | | | | | | | | | | | | | | | |
| 14. MODULATION TECHNIQUES AND CODING CPFSK | 18. PULSE CHARACTERISTICS N/A (frequency modulated) | | | | | | | | | | | | | | | | |
| 16. PRE-EMPHASIS <i>(X one)</i> <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO | 19. POWER <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">a. MEAN up to 1 Watt (optional higher power available 2W)</td> <td style="width: 50%;">b. RATE</td> </tr> <tr> <td>b. PEP up to 1Watt</td> <td>c. WIDTH</td> </tr> <tr> <td></td> <td>d. RISE TIME</td> </tr> <tr> <td></td> <td>e. FALL TIME</td> </tr> <tr> <td></td> <td>f. COMP RATIO</td> </tr> </table> | | a. MEAN up to 1 Watt (optional higher power available 2W) | b. RATE | b. PEP up to 1Watt | c. WIDTH | | d. RISE TIME | | e. FALL TIME | | f. COMP RATIO | | | | | |
| a. MEAN up to 1 Watt (optional higher power available 2W) | b. RATE | | | | | | | | | | | | | | | | |
| b. PEP up to 1Watt | c. WIDTH | | | | | | | | | | | | | | | | |
| | d. RISE TIME | | | | | | | | | | | | | | | | |
| | e. FALL TIME | | | | | | | | | | | | | | | | |
| | f. COMP RATIO | | | | | | | | | | | | | | | | |
| 20. OUTPUT DEVICE HBT | 21. HARMONIC LEVEL <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">a. 2nd -50 dBc</td> <td style="width: 50%;">b. 3rd -60 dBc</td> </tr> <tr> <td colspan="2">c. OTHER</td> </tr> </table> | | a. 2 nd -50 dBc | b. 3 rd -60 dBc | c. OTHER | | | | | | | | | | | | |
| a. 2 nd -50 dBc | b. 3 rd -60 dBc | | | | | | | | | | | | | | | | |
| c. OTHER | | | | | | | | | | | | | | | | | |
| 22. SPURIOUS LEVEL -60 dBc | 23. FCC TYPE ACCEPTANCE NO. NS908P24 | | | | | | | | | | | | | | | | |
| 24. REMARKS <div style="margin-left: 40px;"> BOX 19. 2W order Option available for Government Users “-2W” </div> <div style="margin-left: 40px;"> Microhard Systems Inc. #17, 2135 – 32nd Avenue NE Calgary, AB, Canada T2E 6Z3 Phone: (403) 248-0028 Fax: (403) 248-2762 Attn: Hany Shenouda </div> | | | | | | | | | | | | | | | | | |
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| RECEIVER EQUIPMENT CHARACTERISTICS | | | | | | | | | | | | | |
| 1. NOMENCLATURE, MANUFACTURER'S MODEL NO. n920F (Serial Version) IPn920F (Ethernet / USB Version) | | | 2. MANUFACTURER'S NAME Microhard Systems Inc. | | | | | | | | | | |
| 3. RECEIVER INSTALLATION | | | 4. RECEIVER TYPE Dual Conversion Superheterodyne | | | | | | | | | | |
| 5. TUNING RANGE 902.4 to 927.6 MHz | | | 6. METHOD OF TUNING Synthesis PLL | | | | | | | | | | |
| 7. RF CHANNELING CAPABILITY 250kHz or 280kHz @ 230.4kbps / 400kHz @ 345kbps | | | 8. EMISSION DESIGNATOR(S) FM Modulated Receiver | | | | | | | | | | |
| 9. FREQUENCY TOLERANCE 2.5 PPM | | | 11. RF SELECTIVITY (X and complete as applicable) <div style="text-align: center;"> <input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;">a. -3 dB</td> <td style="width: 50%; padding: 5px;">38MHz</td> </tr> <tr> <td style="padding: 5px;">b. -20 dB</td> <td style="padding: 5px;">50 MHz</td> </tr> <tr> <td style="padding: 5px;">c. -60 dB</td> <td style="padding: 5px;">75 MHz</td> </tr> <tr> <td colspan="2" style="padding: 5px;">d. Preselection Type SAW Bandpass Filter</td> </tr> </table> | | | a. -3 dB | 38MHz | b. -20 dB | 50 MHz | c. -60 dB | 75 MHz | d. Preselection Type SAW Bandpass Filter | |
| a. -3 dB | 38MHz | | | | | | | | | | | | |
| b. -20 dB | 50 MHz | | | | | | | | | | | | |
| c. -60 dB | 75 MHz | | | | | | | | | | | | |
| d. Preselection Type SAW Bandpass Filter | | | | | | | | | | | | | |
| 10. IF SELECTIVITY | 1st | 2nd | 3rd | | | | | | | | | | |
| a. -3 dB | 500 kHz | 280kHz / 500kHz | | | | | | | | | | | |
| b. -20 dB | 750kHz | 740 kHz / 850 kHz | | | | | | | | | | | |
| c. -60 dB | 1.3MHz | 1600 kHz / 2000 kHz | | | | | | | | | | | |
| 12. IF FREQUENCY | | | | 13. MAXIMUM POST DETECTION FREQUENCY 120kHz @ 230.4kbps 175 kHz @ 345kbps | | | | | | | | | |
| a. 1st 243.95MHz | | | | 14. MINIMUM POST DETECTION FREQUENCY N/A | | | | | | | | | |
| b. 2nd 10.7MHz | | | | 16. MAXIMUM BIT RATE 230.4 kbps / 345kbps | | | | | | | | | |
| c. 3rd | | | | 17. SENSITIVITY | | | | | | | | | |
| 15. OSCILLATOR TUNED | 1st | 2nd | 3rd | a. SENSITIVITY -108 dBm | | | | | | | | | |
| a. ABOVE TUNED FREQUENCY | X | X | | b. CRITERIA 10 ⁻⁵ BER | | | | | | | | | |
| b. BELOW TUNED FREQUENCY | | | | c. NOISE FIG ≈ 2.5 dB | | | | | | | | | |
| c. EITHER ABOVE OR BELOW THE FREQUENCY | | | | d. NOISE TEMP N/A | | | | | | | | | |
| 18. DE-EMPHASIS (X one) <input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO | | | | 20. SPURIOUS REJECTION > 70 dBc | | | | | | | | | |
| 19. IMAGE REJECTION - 70 dBc | | | | | | | | | | | | | |
| 21. REMARKS <div style="margin-top: 10px;"> Microhard Systems Inc. Attn: Hany Shenouda Item 10. IF Selectivity (230.4kbps / 345kbps) </div> | | | | | | | | | | | | | |
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| ANTENNA EQUIPMENT CHARACTERISTICS | | |
| 1. <input type="checkbox"/> a. TRANSMITTING <input type="checkbox"/> b. RECEIVING <input type="checkbox"/> c. TRANSMITTING AND RECEIVING | | |
| 2. NOMENCLATURE, MANUFACTURER'S MODEL NO. | 3. MANUFACTURER'S NAME | |
| 4. FREQUENCY RANGE | 5. TYPE | |
| 6. POLARIZATION | 7. SCAN CHARACTERISTICS | |
| 8. GAIN | a. TYPE | |
| a. MAIN BEAM | b. VERTICAL SCAN | |
| b. 1st MAJOR SIDE LOBE | (1) Max Elev | |
| | (2) Min Elev | |
| | (3) Scan Rate | |
| 9. BEAMWIDTH | c. HORIZONTAL SCAN | |
| a. HORIZONTAL | (1) Sector Scanned | |
| b. VERTICAL | (2) Scan Rate | |
| | d. SECTOR BLANKING (<i>X one</i>) <input type="checkbox"/> (1) YES <input type="checkbox"/> (2) NO | |
| 10. REMARKS | | |
| CLASSIFICATION UNCLASSIFIED | | |

Nano Series - n920



OEM 900 MHz Wireless Modem

For size conscious consumers, consider the Nano Series with its small footprint and design flexibility. The Nano Series offers the reliability, features, and performance of our larger modems, yet can fit almost anywhere! Fully compatible with MHX series radio modems!

Applications

- Robotics
- Remote Control
- Telemetry, DGPS
- Electric, Oil & Gas Sensors/Detection
- Display Signs
- Small Enclosure Communication Devices
- Industrial Communications



Microhard Systems Inc.'s proprietary radio technology excels in the most demanding RF and physical environments.

The Nano Series features robust, high speed, low latency, secure data communications. The n920 has full serial and diagnostics data capabilities and is 'radio compatible' with 910/910A and 920/920A modems! The n920 offers excellent noise figure, superior interference rejection, agile frequency synthesis, digital modulation, and matched filter detection. The n920 can support 1.2Mbps and higher!

Features of the n920

- Supports up to 1.2Mbps (higher rates available, contact Microhard for details)
- Quad Filter Stage provides Extreme Noise & Interference Rejection
- Supports Point-to-Point, Point-to-Multipoint, Store and Forward Repeater, TDMA
- Maximum allowable transit power (1W)
- Low Power consumption in Sleep and Sniff modes
- 32 bits of CRC, selectable Forward Error Correction with retransmit
- Separate diagnostics port—transparent remote diagnosis and online network control
- Very Small Footprint
- MHX910 and MHX920A compatible interface card available

N920 Interface Card



Nano Series - n920 Specifications



| | | | | |
|----------------------|---|--|--------------|---|
| Frequency | 902-928 MHz | Connectors: | Antenna Data | MMCX 60 Pin OEM Header |
| Spreading Method | Frequency Hopping / DTS | Environmental | | -40°F - +185°F (-40°C - +85°C) 5-95% humidity, noncondensing |
| Band Segments | Selectable via Freq Restriction | Weight | | Approx. 0.7 oz. (19 grams) |
| Error Detection | 32 bits of CRC, ARQ | Dimensions | | Approx. 1.25" x 2.0" x .25" (32mm x 51mm x 6.35mm) |
| Encryption | 128-bit AES (NOT AVAILABLE on any Export versions) | Approvals | | FCC Part 15.247 IC RSS210 |
| Range | 60+ miles (100+ km) (dependant on link rate and line of sight) | Order Options | | |
| Sensitivity n920F | -108 dBm @ 172 kbps link rate | | | |
| Output Power | 100mW - 1W (20-30dBm) | Export | | |
| Serial Interface | TTL | | | |
| Serial Baud Rate | - Up to 230.4 kbps asynchronous - Up to 3.2 Mbps synchronous | -C1D2 | | |
| Link Rate | Up to 1.2Mbps (higher rates available, contact Microhard for details) | | | |
| Operating Modes | Point-to-Point, Point-to-Multipoint, Store & Forward Repeater, Peer-to-Peer | Class 1 Div 2 (for use in hazard-ous environments) | | |
| Signals Interface | RxD1, TxD1, RTS, CTS DCD, DSR, DTR, RxD2, TxD2, RSSI LEDs, Tx/Rx LEDs, Reset, Config, Wake-up, RSmode | | | |
| Diagnostic Port | RS232: RxD, TxD | | | |
| Diagnostics | Battery Voltage, Temperature, RSSI, Real-time event logging and remote diagnostics | | | |
| Rejection | Quad Filter Stage provides excellent strong signal interference & rejection characteristics | | | |
| Core Voltage | 3.3VDC Nominal (+/- 0.3V) | | | |

Contact Information

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Specifications subject to change without notice.

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