Integration Manual

1. Introduction

The JRD-1171 is a low-power Bluetooth Low Energy module based on the Nordic nRF52840 SoC, integrating a 2.4 GHz transceiver with on-chip PA and LNA to support up to +3.8 dBm output and –103 dBm sensitivity. It exposes UART, USB, SWD and GPIO interfaces for data, programming, and test modes, and is powered from a single 2.7 V–5.5 V input. RF is routed through an onboard band-pass filter to a u.FL connector for external antennas. This module is certified under FCC Part 15.247 and intended for internal use only; see the Theory-of-Operation exhibit for full tech-

2. Applicable FCC Rules

- FCC Part 15.247: Bluetooth Low Energy in the 2.4 GHz ISM band.
- FCC Part 15 Subpart B (Disclaimer): host product must handle unintentional-radiator compliance (digital logic).

3. Operational Use Conditions

- Indoor/Outdoor: No restriction (module is BLE, typical consumer/industrial environments).
- Aircraft: Not for use on aircraft.
- Altitude: No specific limit.
- Antenna Restrictions: Must use approved antennas from the following table
- Power-Output: +3.8 dBm maximum (with PA).

4. Limited-Module Procedures

NOT APPLICABLE
This module is a limited module for grantee-internal use only and will never be sold or shipped to third parties. Integration instructions are maintained as confidential manufacturing documents in the Theory-of-Operation exhibit.

5. RF-Exposure Considerations

Host-Manufacturer Instructions: Maintain ≥ 20 cm separation from any user. Do not co-locate with other transmitters.

End-User Manual Text:

"To comply with FCC RF exposure limits for an uncontrolled environment, this device must be installed to provide a minimum distance of 20 cm between the antenna and all persons."
SAR/MPE Reports: Certified under KDB 447498 guidelines; see internal RF-Exposure exhibit for full test reports.

6. Label & Compliance Info

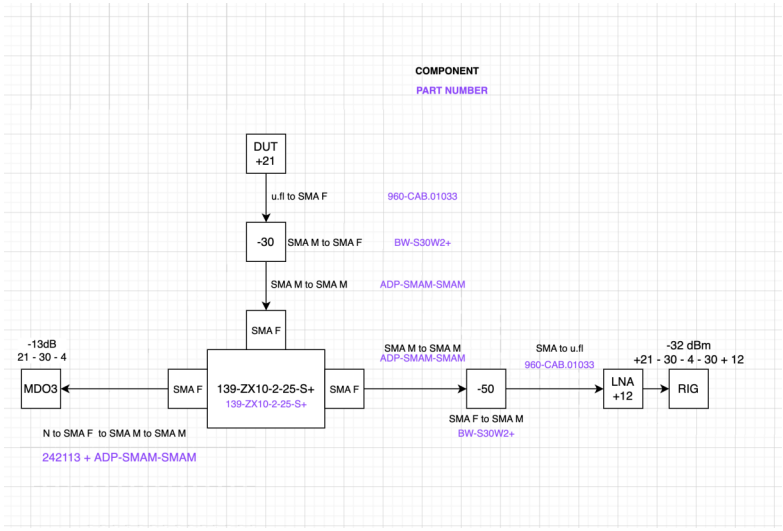
e-label/Physical Label: "Contains FCC ID: 2BNX4-JRD1171"
"Contains IC: 33610-JRD1171"

Label Guidelines: Follow KDB 784748 for formatting and placement.

7. Test Modes & Additional Host-Side

RF Test Firmware: Use JR Dynamics' factory test system to verify TX power and frequency.

Procedure:
The module is tested on a test fixture which is powered via a USB cable.
Mount the module under test on the test fixture and connect to Raspberry Pi via USB C to USB A cable.
Connect the Test transceiver to the Raspberry Pi via USB C to USB A cable.
Connect Raspberry Pi to MDO3014 Oscilloscope via USB A to USB B cable.
Make RF connections as per the figure below.



Run the rf-module-testrig script from the Raspberry Pi

8. Part 15 Subpart B Disclaimer

"This modular transmitter is authorized only under FCC rules listed in §2 The host product manufacturer is responsible for ensuring compliance to all other FCC rules (e.g., digital circuits under Part 15 Subpart B) when this module is installed."

9. EMI Considerations

- **Best Practices:** See KDB 996369 D04 Module Integration Guide for stand-alone and simultaneous-TX EMC testing.

- **Layout Tips:** Maintain a 10 mm clearance between RF feed and high-speed digital lines; use ground pours under antenna feed; follow the reference PCB layout in the Theory-of-Operation.

10. How To Make Changes

Permissive Changes: Only the grantee (JR Dynamics Ltd.) may file Class II permissive changes.