OrbitLink Consulting

UNLOCKING THE POTENTIAL OF SPACECRAFT CONTROL AND COMMUNICATIONS

DEFENSE-ALIGNED SUPPLY CHAIN / DSDR REV A WIDEBAND SDR RECEIVER

Wideband SDR over Wi-Fi.
No PRC-headquartered parts.

A compact software-defined receiver covering **HF through 1.7 GHz** that digitizes, converts to I/Q and streams on its own, over **Wi-Fi 6** or USB. Every component comes from a manufacturer headquartered outside the PRC, and the board is designed for assembly by a domestic integrator.

0.5 MHz–1.7 GHz
HF direct input plus a 24 MHz–1.7 GHz tuner

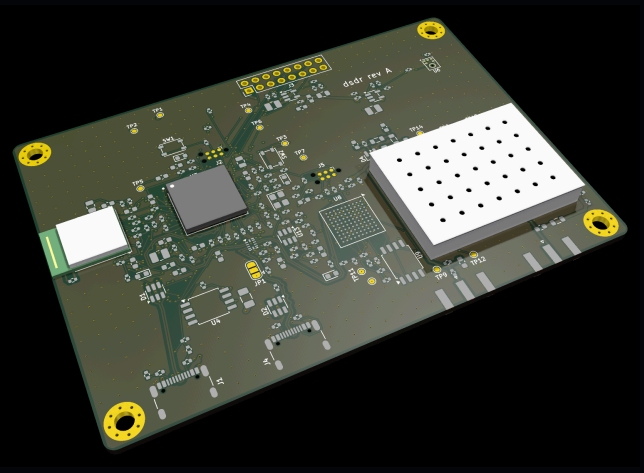
80 MS/s, 12-bit
High-speed ADC digitizer, coherent with the tuner LO

Wi-Fi 6 + BLE
FCC modular-approved radio, internal antenna

100 × 70 mm
Four-layer board, USB-C powered

USB 2.0 HS
Second USB-C port works as a PC SDR

±2.5 ppm
One TCXO clocks both the tuner and the ADC



DESIGN RENDERING

01
RF front end

- **Rafael Micro R860** tuner, 24 MHz–1.7 GHz, on its own SMA input
- **HF direct sampling**, 0.5–26 MHz, through a 26 MHz low-pass on a second SMA
- Switchable, current-limited **bias tee** for active antennas and LNAs
- Shielded RF section, impedance-controlled 50 Ω lines

02
Digitizing & processing

- **NXP LPC4370** 80 MS/s, 12-bit digitizer
- One **±2.5 ppm TCXO** clocks both tuner and ADC
- **NXP i.MX RT1062** 600 MHz Cortex-M7 does real-to-I/Q conversion and decimation on board
- Targets **2.4–3 MS/s** I/Q, enough for rtl_tcp-class streaming

03
Connectivity

- **u-blox MAYA-W276**: Wi-Fi 6 dual-band, Bluetooth LE and 802.15.4
- FCC modular approval **XPYMAYAW2A**, no external antenna to qualify
- Second USB-C turns the board into a **USB 2.0 high-speed SDR** for a PC
- On-board I²S MEMS microphone for acoustic sensing

04
Supply-chain assurance

- Silicon from **NXP, u-blox, TI, Rafael Micro, Winbond, ST** and onsemi
- No parts from **PRC or Hong Kong brands**
- Genuine parts from approved manufacturers
- Built for domestic assembly with per-lot country-of-origin data

05
Build & assembly

- Assembles on standard SMT lines: **0.8 mm-pitch BGAs**, ENIG finish
- Standard 4-layer stackup with 0.4/0.2 mm vias, no exotic process
- Low-noise supply: dual TI bucks plus 7 µVrms LDO for the ADC
- Four corner mounting holes, edge-mounted RF and USB connectors

06
Maintainable design

- Both processors **reflash in-system** over USB, no programmer needed
- SWD on Tag-Connect pads
- 2×8 expansion header for I/O

NOTICES

Figures are design values or estimates, not measurements. Available for US Government use and as evaluation kits for product developers, software developers and system integrators. Defense-aligned describes part selection, not NDAA, TAA or DFARS compliance.

Need a receiver your supply chain can defend?

Request a quote and share your requirements and timeline.

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