OrbitLink Consulting

UNLOCKING THE POTENTIAL OF SPACECRAFT CONTROL AND COMMUNICATIONS

PRODUCT BRIEF / S-BAND FULL-DUPLEX CUBESAT PC/104 RADIO CARD

Full-duplex S-band radio for aerospace and space.

A tunable radio card for **aerospace and space applications**, on a CubeSat PC/104 card that works from 1U up. A **space-rated variant is available**. Separate transmit and receive chains cover **2.0–2.5 GHz**, and the host connects over CAN, I²C or UART, with USB-C for ground test.

2.0–2.5 GHz
TX and RX each tunable, single-conversion superhet

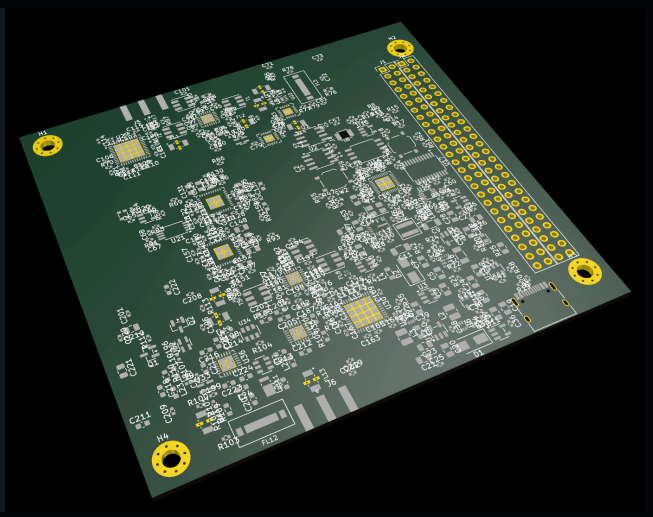
+27 dBm
Transmit estimate, including OFDM

2.2 dB
Receiver noise figure estimate at 2.2 GHz

PC/104
CubeSat Kit H1/H2 stack, 96 × 90 mm board

1.76 A at 5 V
Full-duplex budget from typical currents

O-QPSK, OFDM, FSK
On-chip modems, AT86RF215



DESIGN RENDERING

01
Frequency coverage
- Covers the **2025–2110 MHz** uplink and **2200–2290 MHz** downlink
- Also tunes **2400–2450 MHz** amateur and ISM
- Switched RX sub-band preselector

02
RF architecture
- Single-conversion superhet design
- Independent synthesizer and mixer per direction
- Separate TX and RX **SMA** ports

03
Modems
- Two **Microchip AT86RF215** transceivers, one for RX and one for TX
- O-QPSK, OFDM and FSK driven over SPI
- On-board **ESP32-C6** controller

04
Transmit and receive
- Balanced power amplifier pair
- Low-noise amplifier at the receiver input
- Fixed-band filtering for full-duplex operation

05
Host interface
- CubeSat Kit bus: **CAN, I²C, UART**
- Runs from VBATT through a wide-input buck
- **USB-C** for power and console in ground test

06
Space and build
- **Space-rated variant available**
- Six-layer board with grounded coplanar RF lines and shield cans

NOTICES

Figures are design values or estimates, not measurements. Transmitting requires the appropriate spectrum authorization. Available for US Government use and as evaluation kits for product developers, software developers and system integrators.

Flying S-band on your next mission?

Request a quote for aerospace or space-rated units. Tell us your band plan, data rate and bus.

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