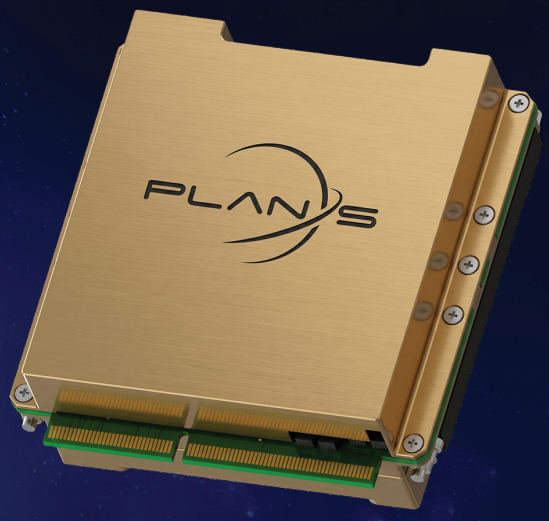
PLAN-S
SATELLITE & SPACE
TECHNOLOGIES

SOFTWARE DEFINED RADIO
SDR



Flight Proven Flexible Design

This compact, high performance SDR platform enables flexible satellite communication from 70 MHz to 6 GHz. SDR supports multiple RF frontend and offers in orbit reconfigurability through an embedded Linux system.

Designed for small spacecraft, SDR provides scalable processing capability and multiapplication support within a single, modular radio subsystem.

KEY HIGHLIGHTS

- Features a software-defined architecture with multiple RF frontend
- Combines a proven design, a low-power digital signal processing chain, and robust waveform support for stable operation during rapid orbital passes
- Builds on space heritage gained through multiple flight-qualified missions
- Provides a reliable and reconfigurable communication solution for both single-satellite and constellation deployments

MISSION BENEFITS

Edge Connector-Based Integration: Utilizing an edge connector interface to the motherboard effectively reduces overall cable harness requirements.

TECHNICAL FEATURES

HARDWARE

Frequency Range & Channel Bandwidth	**RX/TX:** 70 MHz - 6 GHz 56 MHz
SoC Based Flexible Design	Zynq UltraScale+ XCZU4EV or Zynq UltraScale+ XCZU6EG or XCZU15EG
Memory	4 Mbit /8 Mbit SPI FRAM 128 Gbit SD Memory **PS:** 1 GB / 2 GB DDR4 RAM **PL:** 512 MB / 1 GB / 2 GB DDR4 RAM **QSPI:** 32 MB **eMMC:** 16 GB, 32 GB, 64 GB
Flexible RF Frontend	UHF, S-Band
Supply Voltage	**SDR_PWR:** 6-15V **FE_PWR:** Depends on RF FE
Power Consumption	< 7W (without RF_FE)
Interfaces	LVDS, JTAG, I2C, UART, SPI, USB, CAN, ETHERNET 0.8mm Pitch Edge Type Connector (compatible with Samtech HSEC8-DV)
Mass	<280 gr

TECHNICAL FEATURES

SOFTWARE

Core Software Platform

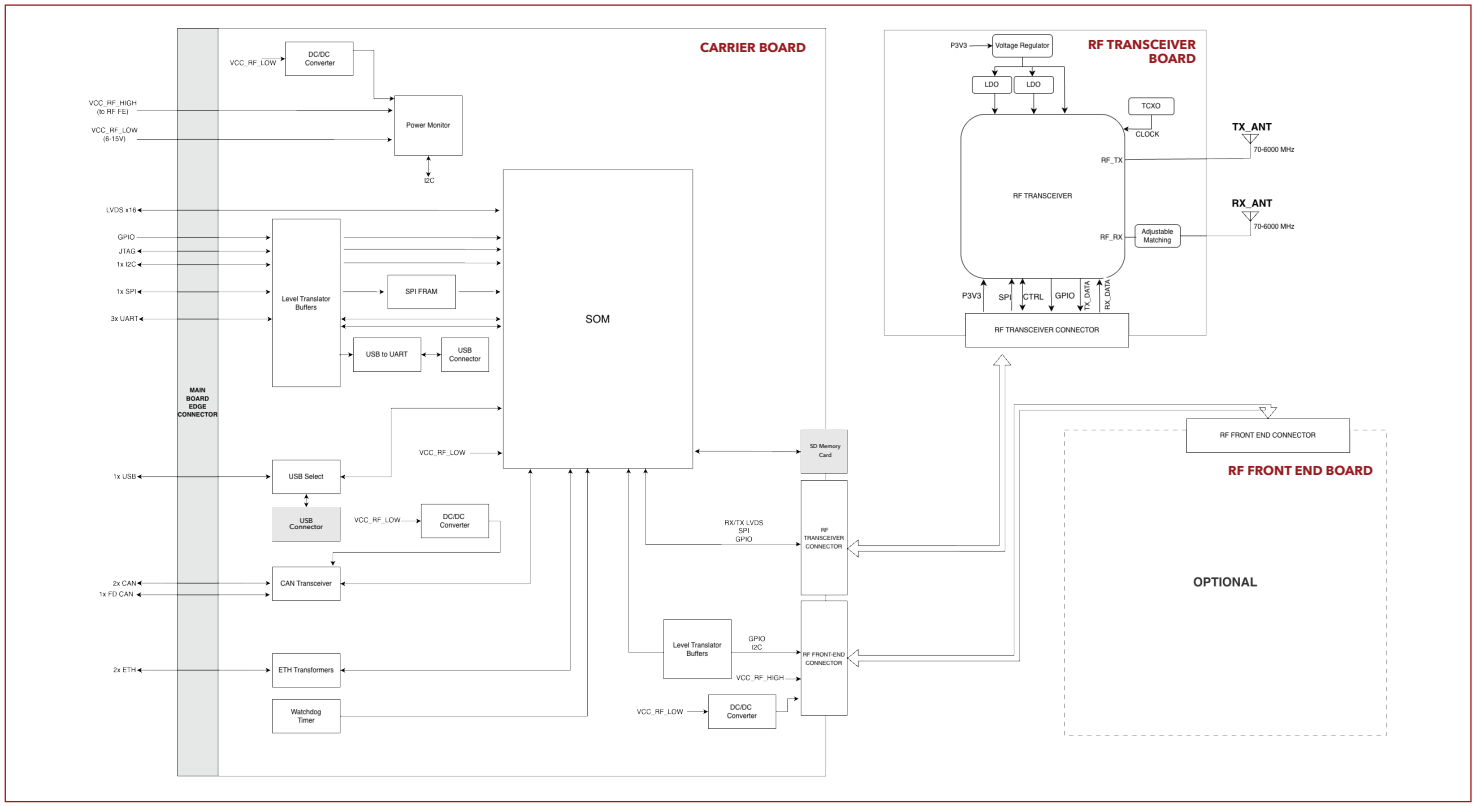
- Fully customizable embedded Linux BSP, built upon ADI Linux
- Integrated IIO framework for RF transceiver configuration and streaming
- Tight PS–PL integration enabling FPGA-accelerated signal processing workflows
- Support for multiple boot media configurations
- Robust in-orbit software update capability with fail-safe mechanisms
- Update state maintained via FRAM, fully independent of boot media
- Seamless A/B root filesystem switching for reliable upgrades
- PL bitstream updates supported without requiring full system reflash
- Boot diagnostics including boot count and failure tracking

  Plan-S CSP (CubeSat Space Protocol v1.6 fully compliant) networking stack
- Dedicated persistent user configuration storage within FRAM

Optional Software Package
Onboard Service Framework

- Service-oriented onboard software framework for modular and extensible payload applications
- CSP-native distributed architecture, with each service operating as an independent network node
- Unified messaging backbone for communication across onboard services and external subsystems
- Centralized service lifecycle management with health monitoring and automatic recovery
- Integrated system and hardware telemetry with event-driven control capabilities
- Reliable in-orbit software and file transfer services over CSP-based links
- Persistent configuration management across software updates and boot media changes
- Structured data logging for real-time monitoring and post-mission analysis

BLOCK DIAGRAM



HERITAGE / QUALIFICATION

- **Random Vibration Qualification**

  Axial 12G 20Hz 1s

  Lateral 16.875G 20 Hz 1s

- **Proven in Orbit**

  Flight heritage demonstrated on 16 satellites with 32 units

- **Thermal Cycling Test**

  –40 °C to +85 °C, 10 Cycles

STANDARDS & COMPLIANCE

- **Environmental Verification**

  Compliant with NASA GEVS (GSFC-STD-7000)