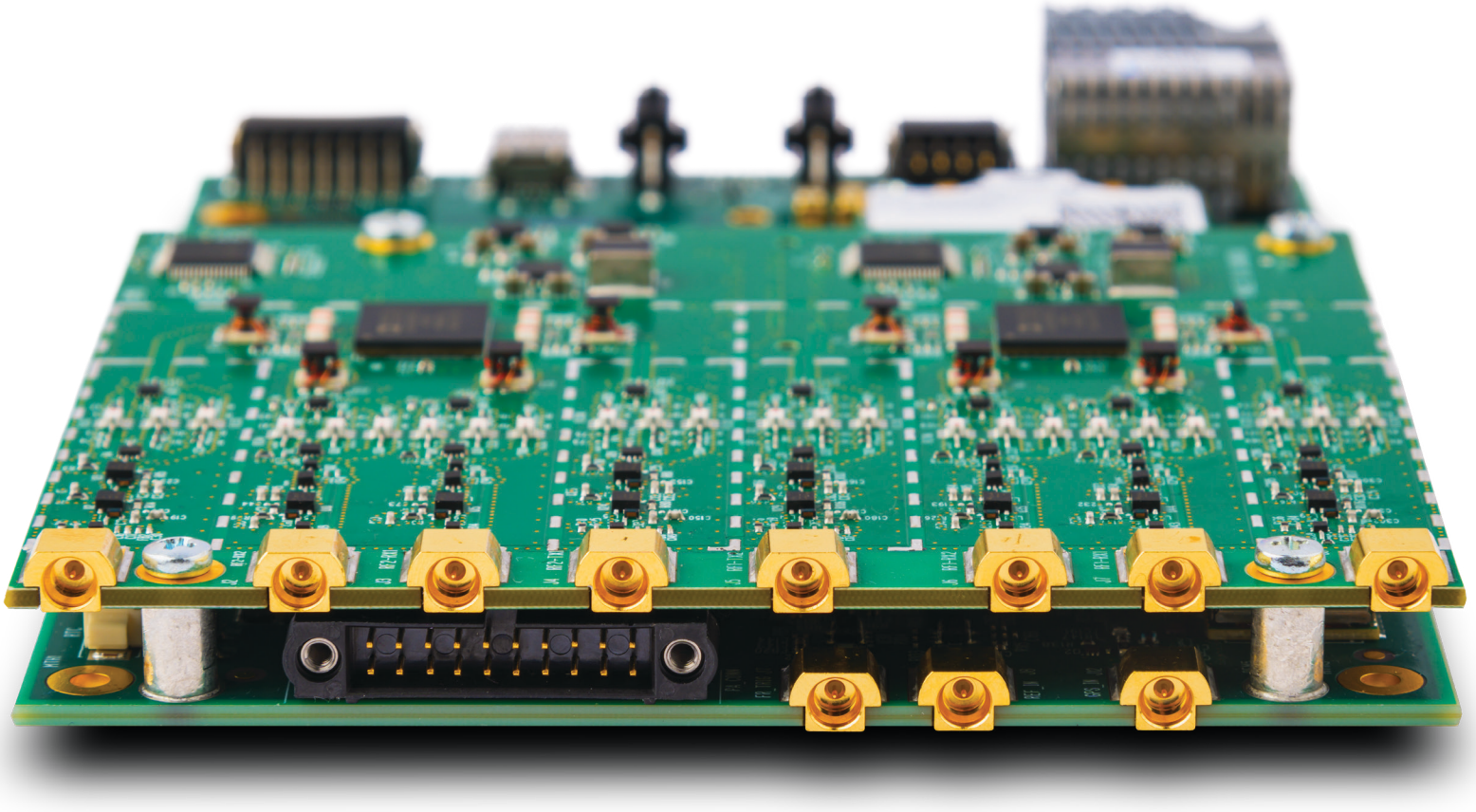


OctNode2

Dual Channel 5G Small Cell & RRU Platform

octasic

5G-ready SDR Platform

OctNode2 is a frequency-agile, 5G-ready, software-defined radio (SDR) small cell platform for base stations, and a development platform for Remote Radio Units (RRUs). It integrates Octasic's OCT3032W System-on-Chip (SoC), two RF transceivers, and all necessary interfaces and circuitry. Each transceiver supports dual antenna operation (2x2 MIMO) and FDD/TDD multiplexing, with a frequency range of 400 MHz to 6 GHz. OctNode2 is a perfect fit for applications requiring small size, low power consumption, and frequency agility.

The platform supports Octasic's full flexiPHY L1 software suite, including 5G NR, 4G LTE/LTE-Advanced, 3G UMTS/HSPA, 2G GSM/GPRS/EDGE, CDMA2000, as well as Octasic's Radio Utilities System (RUS), which supports passive digital network scan for BTS applications, or LTE/5G for UE applications.

The OCT3032W SoC can simultaneously control both onboard RF transceivers, each of which can run a different radio access technology (RAT). OctNode2 supports any combination of RAT's, including GSM, UMTS, CDMA2000, LTE, 5G or custom waveforms. Its integrated quad-core Cortex-A7 ARM processor can run the higher layer software (protocol stack) for any 3GPP standard while incorporating Octasic's flexiPHY offering that is pre-integrated with commercial Layer 2/3 protocol stacks, including those from leading vendors. OEMs can integrate their own Layer 2/3 stack, or implement full custom waveforms using Octasic's Opus Studio development environment. OEMs can leverage the complete hardware and software solution to deliver high-performance base stations offering their own differentiating features, while reducing development time, cost, and risk.

Key Features

- Small form factor with low power consumption
- Dual 2 x 2 MIMO radio sectors independently support any waveform
- Pre-packaged SDR solutions for GSM/EDGE, UMTS/HSPA, CDMA2000, LTE/LTE-A, and 5G NR
- Fast frequency agility, 400 MHz to 6 GHz
- Support for LTE-Adv and 5G NR sub-Gbps throughputs
- Local Wi-Fi coverage

Platform Description

OctNode2, includes all network interfaces, packet processing, baseband processing, and low-power RF functions. The platform integrates Octasic's next generation OCT3032W baseband SoC with an on-chip integrated quad-core Cortex-A7 Arm processor and dual 2X2 MIMO transceivers to simultaneously support two air interfaces. Two transceiver options are available, as mezzanine boards, depending on application requirements.

OctNode2 also includes support for a pluggable Wi-Fi module to offer local Wi-Fi services in the vicinity.

Applications

- Outdoor small cell BTS with full mobility and extended range
- Remote Radio Units (RRU) running 'Low PHY' components, based on O-RAN architecture (O-RU)
- Deployable wireless network for Emergency, Public Safety, and Tactical use
- Man-portable, vehicle-mounted, and airborne BTS for Public Safety and Tactical use
- Embedded communications systems on UAVs and remote-controlled vehicles
- Custom waveforms and mesh networks
- Portable network analyzers and UE testers
- Compact, self-contained Network-in-a-Box
- Enterprise small cell base station

From Platform to System

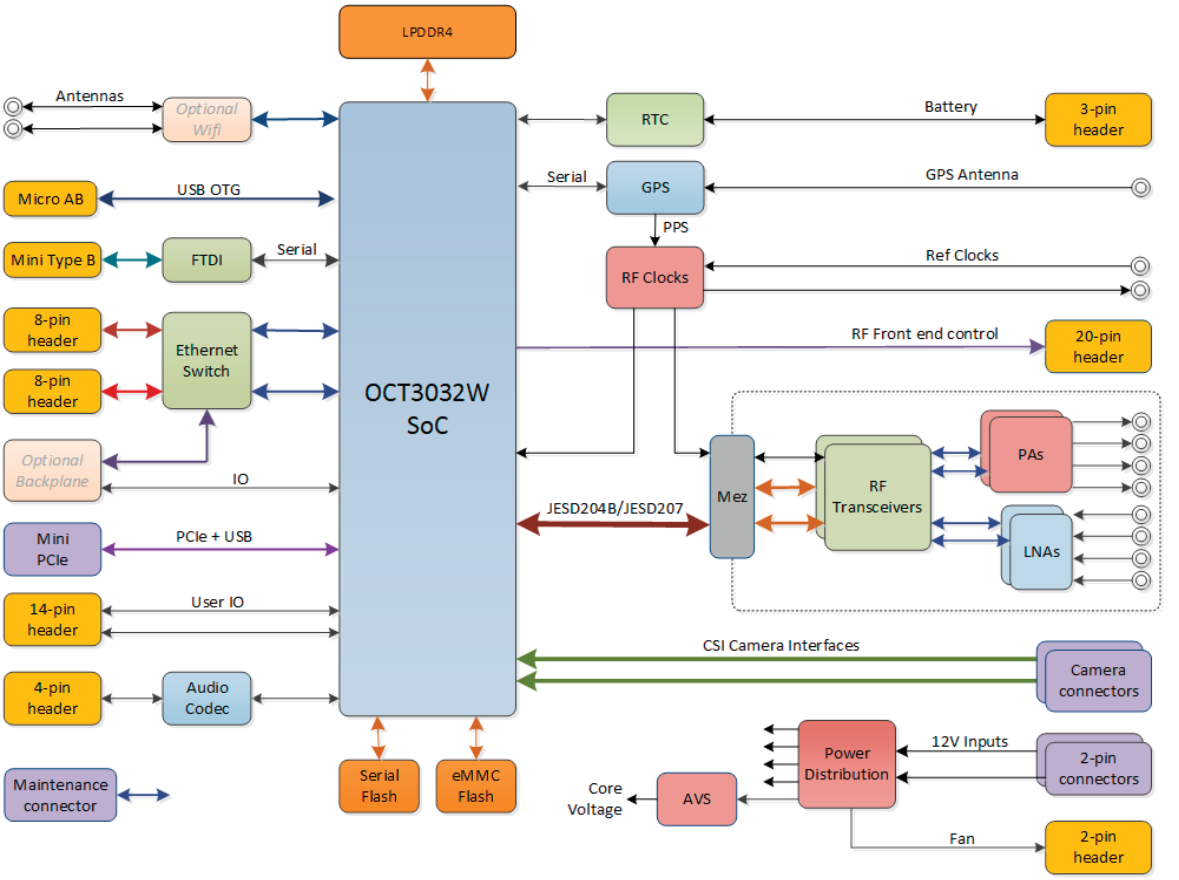
To assist customers in reducing their time to market, Octasic has pre-integrated L2/L3 protocol stacks, as well as similar offering from leading vendors, including Radisys and Altran.

By starting from an OctNode2 platform with its pre-integrated wireless software, OEMs can focus their efforts on designing their own RF front ends (power amplifier, duplexer, and low-noise amplifier if necessary), power supply and packaging, as well as any necessary software applications.

Extended Environmental Performance

OctNode2 is designed for outdoor applications and challenging environments and comes with a pre-installed heat sink for thermal dissipation. Power consumption is approximately 20 Watts for the base station without a power amplifier, making it ideal for power-efficient designs and convection-cooled applications.

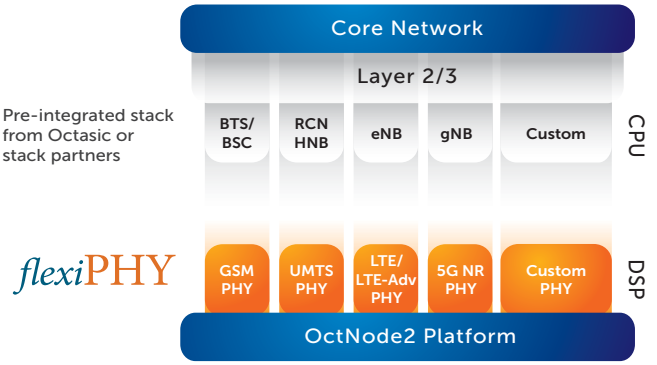
OctNode2 Components Diagram



Software for All Standards

Software Solution

OctNode2 facilitates the work of OEMs and system integrators by providing full access to integrated hardware/software packages. Pre-integrated software solutions are available for a variety of air interfaces including GSM/EDGE, UMTS/HSPA, CDMA2000, LTE/LTE-Advanced, and 5G NR.



Applications Support

Aside from being a small cell platform, OctNode2 can act as a reference in a range of applications, including a 4G/5G UE for the Industrial IoT/Public Safety market or a 5G RRU that hosts the Low-PHY node in an O-RAN architecture application.

Comprehensive SDR Platform

OctNode2 Technical Description

Transceiver Specifications

Number of bands	2 (simultaneous)
MIMO support	2 x 2 (each sector)
Duplexing	TDD and FDD
Operating frequency range	400 MHz to 6 GHz
RF tuning time	25 micro-seconds
Channel sizes	1.4, 3, 5, 10,15, 20-100 MHz
Air link support	GSM/EDGE, UMTS/HSPA, CDMA2K, LTE-FDD/TDD, 5G NR, and custom waveforms
3GPP Compliance	TS 38.104 (5G NR), TS 36.104 (E-UTRA), 25.104 (UTRA)
RF output power	5-10 dBm
Rx Noise Figure (NF)	<6 dB
RF connectors	50 ohms, SMP, full detent, edge mount

Digital Section Specifications

DSP	Octasic 32-cores OCT3032W baseband processor
CPU	Embedded Arm Cortex-A7 control processor
CPU Operating System	Linux 4.14 or later
Memory	4GB DDR3, 16GB eMMC Flash

Interface ports

Network interfaces	Ethernet 10/100/1000 Base T; 802.1 VLAN support; PCIe
Management interfaces	1 x USB 1 x 1 Gigabit Ethernet (GE)
Synchronization sources	GPS (on-board), PTP, NTP, SyncE, 1PPS–30.72 MHz external reference

Mechanical, Power, Environmental

Board dimensions	140 x 100 x 18.8 mm (5.51" x 3.93" x 0.7")
Supply voltage	12 V
Power consumption (typical)	20 W
Operating temperature	-40° C to + 85° C ambient

Ordering Options

RF transceiver (mezzanine board)	2 x ADI9361 "Catalina" (40 MHz maximum bandwidth) 2 x ADI9371 "Mykonos" (100 MHz maximum bandwidth)
Wi-Fi module (for local coverage)	WLAN IEEE802.11 11a/11b/11g/11n, 2.4 GHz, 5 GHz

High Performance SDR Platform

OctNode2 is a fully-programmable SDR base station platform supporting all 3GPP standard air interfaces (including 5G NR) and proprietary (non-3GPP) waveforms, over a wide range of frequencies and channel bandwidths. It provides a range of features designed to optimize the performance of base stations and radio systems, including:

- Each transceiver/baseband combination can be configured as an independent radio sector
- Hardware Acceleration Blocks (HABs) for 4G/5G functions and a Core Integrated Hardware Accelerator (CIHA) vector processing engine for sub-Gbps 4G/5G speeds
- Software-controlled frequency agility from 400 MHz to 6 GHz, with a frequency tuning time of 25 micro-seconds
- Power consumption control, leveraging OCT3032W's programmable power islands that switch off power to unused hardware blocks for significant power savings

Development Environment

Octasic offers a complete suite of development tools for OEMs or system integrators wishing to integrate their own Layer 2/3 software, or develop their own PHY layer and waveform code, including:

- Opus Studio integrated development environment (IDE)
- OctNode2 Evaluation and Development Kit (hardware and software)
- OctNode2 board support package (drivers)
- Source code licenses for flexiPHY

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