

RNS802 4G/5G PHY SoC

Product Brief

Product Summary

The RNS802 is a purpose-designed PHY SoC for 5G NR/LTE disaggregated and integrated RAN architectures, and meets industry-leading Open RAN specifications. The RNS802 interfaces with a layer 2/3 stack via the SCF FAPI interface over PCIe. The RNS802 supports seamless interfacing to Radio Units (O-RU) via the O-RAN Open Fronthaul eCPRI interface, or directly to RFICs with a standardised JESD204B high-speed serial interface.

Key Applications

The RNS802 SoC is designed for 5G and 4G platforms in the following network deployments:

- ◆ Indoor residential, enterprise, private and industrial networks
- ◆ Neutral host networks
- ◆ Outdoor networks

The RNS802 can be used in the following architectures:

- ◆ Integrated 4G eNB or 5G gNB
- ◆ Dual mode 4G/5G RAN
- ◆ Split 2 and 6 disaggregated RAN
- ◆ Split 7.2x O-RAN Distributed Unit (DU)

Key Features

- ◆ Silicon powers RANsemi's 5G, LTE and dual mode PHY software
- ◆ SCF FAPI interfaces
- ◆ Ceva XC12 5G-optimised vector signal processors
- ◆ RISC-V scalar processor clusters
- ◆ Codecs: LDPC, Turbo and Polar
- ◆ Fourier transforms: FFT, iFFT
- ◆ Equalisers: MMSE/MMSE-IRC/MLD
- ◆ Digital Front End (DFE)
- ◆ O-RAN eCPRI Open Fronthaul
- ◆ IQ compression/decompression
- ◆ Secure on-chip boot capability
- ◆ Debug and device monitoring

Key Interfaces

- ◆ 4-lane JESD204B radio interface supporting up to 4 RFICs
- ◆ 10/25 Gigabit Ethernet for eCPRI
- ◆ Gen4 4-lane PCIe interface to NPU
- ◆ LPDDR4 32bit interface (2666/3200MHz)
- ◆ Synchronisation and clock interfaces: IEEE1588v2, GNSS
- ◆ SPI, I2C and GPIO control interfaces

Key Performance

The RNS802 supports 3GPP 5G NR releases 15 and 16, with flexibility for future releases.

The RNS802 also supports single, dual or tri mode LTE, or simultaneous dual 5G NR/LTE mode. This provides support for flexible multi-RAT, multi-carrier component configurations.

5G NR FR1 'Sub-6GHz' summary

- ◆ Up to 4 TX/4 RX RF baseband ports
- ◆ 2 UL/4 DL MIMO layers per cell for 2 cells
- ◆ 4 UL/8 DL MIMO layers for 1 cell
- ◆ 100MHz BW per cell
- ◆ Throughput DL: 4Gbps, UL 2Gbps

5G NR FR2 mmW summary

- ◆ 2 TX/2 RX RF ports for single cell
- ◆ 2 UL/2 DL MIMO layers
- ◆ 400MHz BW
- ◆ Throughput DL: 3Gbps, UL 3Gbps

Dual mode/LTE summary

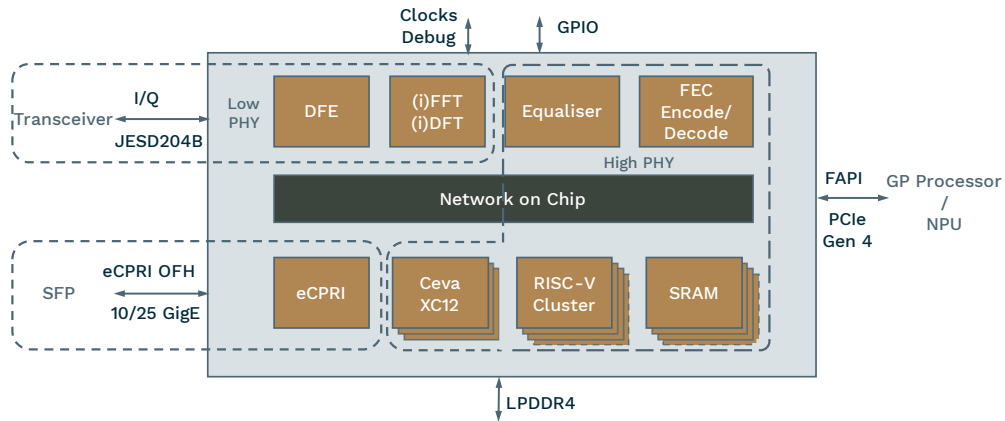
- ◆ Single LTE cell: 4 TX/4 RX antenna ports, 4 UL/4 DL MIMO layers, 20MHz
- ◆ Dual or Tri LTE cells: each cell up to 4 TX/4 RX antenna ports, 2 UL/4 DL MIMO layers, 20MHz
- ◆ Dual mode 5G and 3 LTE cells

Package summary

- ◆ 25mm x 25mm Thermally Enhanced Flip-Chip Ball Grid Array

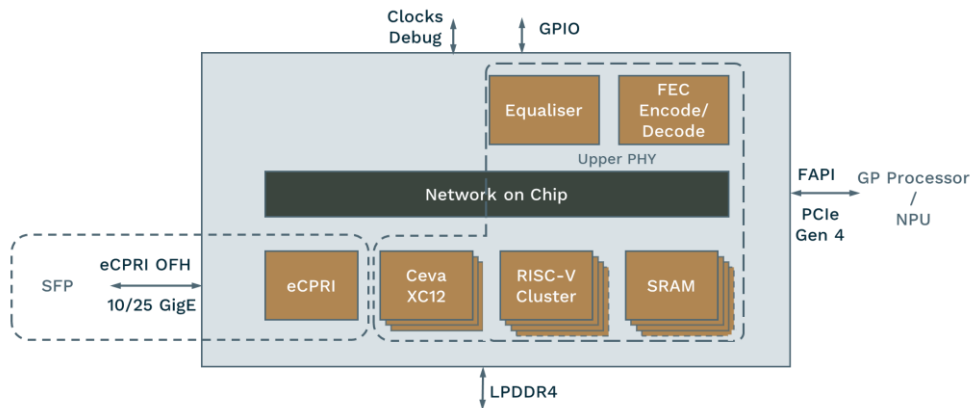


Architecture block diagram



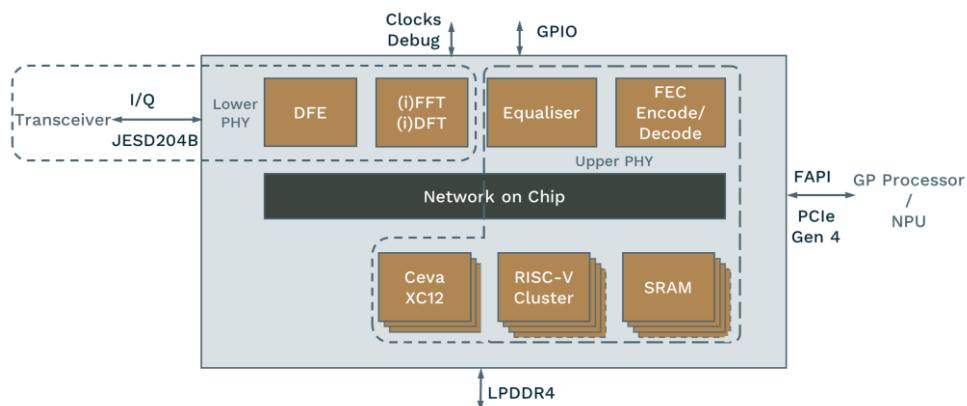
5G NR High PHY O-DU use case

For the O-DU use case the RNS802 runs the RANsemi High PHY software, sending the SCF FAPI messages over the PCIe interface, and interfacing to O-RUs via a O-RAN Alliance compliant 10/25GigE Open Fronthaul interface.



4G/5G Full PHY use case

The RNS802 uses the RANsemi 4G, 5G or dual mode Full PHY software, which supports an SCF FAPI interface to partner L2/L3 software running on NPU over the PCIe interface and connects to partner RFICs over the JESD204B interface.



Further information

For further details about RNS802 silicon, use case support, and RANsemi's supporting platforms and software, please contact your local RANsemi representative or email us at info@ransemi.com