SECURE CONNECTIONS FOR A SMARTER WORLD

PRODUCT OVERVIEW
DIGITAL AIRFAST SOLUTION

AIRFAST DIGITAL MID-POWER, LOW-PHY RF AND ANTENNA DESIGN SOLUTION

Outdoor Small Cell solution with breakthrough size, weight and power

The Airfast digital solution represents a collaboration among three companies to build a turn-key "digital antenna" reference design that removes digital and analog design from customer efforts when designing small cells or O-RAN radio units. On this reference design, NXP implements baseband processing and an RF front-end, Metanoia Communications Inc. provides advanced low-power zero-IF RF transceiver technology and ArgoSemi includes innovative antenna technology that dramatically reduces system form factor and manufacturing complexity. The reference design is optimized for n78 outdoor use cases across private networks and MNO deployment extensions, extending to other RF bands in future derivatives with a common PCB footprint.

PROVEN HARDWARE AND FIRMWARE SOLUTION

The digital Airfast solution is a hardware and firmware solution that provides a true samples-to-antenna reference design. Digital processing components include low-PHY (FFT/IFFT), up/down conversion, Crest Factor Reduction (CFR), Digital Pre-Distortion (DPD) and analog-to-digital conversion. Analog components include a zero-IF RF transceiver, GaN power amplifier and a PCB patch antenna design. Given tight coupling between firmware components, analog component selection, system design in the RF front end and pre-integration of all these components into a reference design, this allows customers to de-risk efforts and reduce time-to-market while focusing on the differentiating features.

SIZE, WEIGHT AND POWER OPTIMIZED

The solution is designed as a tightly optimized integrated PCB, combining all analog and digital components from the SerDes digital interface up to the RF antenna. This level of integration helps remove the design burden from customers as a result of the three companies working together to cross-optimize the solution. A PCB printed antenna reduces the size, weight and power of the solution dramatically while minimizing the manufacturing complexity.

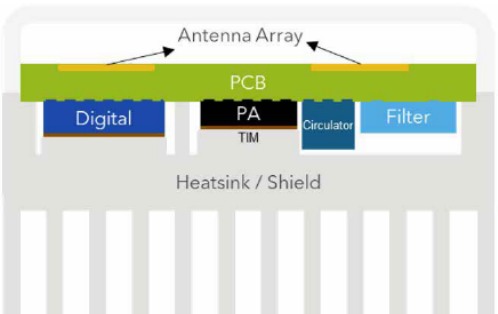
SCALABLE

The reference design is a digital 4-antenna subsystem that interfaces to the low-PHY DSP subsystem through an industry-standard PCIe SerDes interface. This allows the subsystem to be connected to a high-PHY/stack host for implementing an Integrated Small Cell (ISC), or to an eCPRI termination component to build an O-RAN radio unit. In addition, scaling to higher antenna counts (8R8T, 16R16T, …) is supported to enable massive MIMO applications.

SPECIFICATIONS/BENEFITS

- Targeting 5G-NR n78 RF band for initial deployments
- 4T4R (scalable to higher antenna counts)
- 37 dBm (5 W) output power per antenna
- Use case optimized: initial target CBRS (3.55-3.7 GHz), roadmap to other targets with common form factor
- Aggressive size, weight and power (SWaP)
- Aggressive DC power, < 100 W maximum
- PCB level integration—no external cavity filters, integrated printed antenna

SYSTEM ARCHITECTURE



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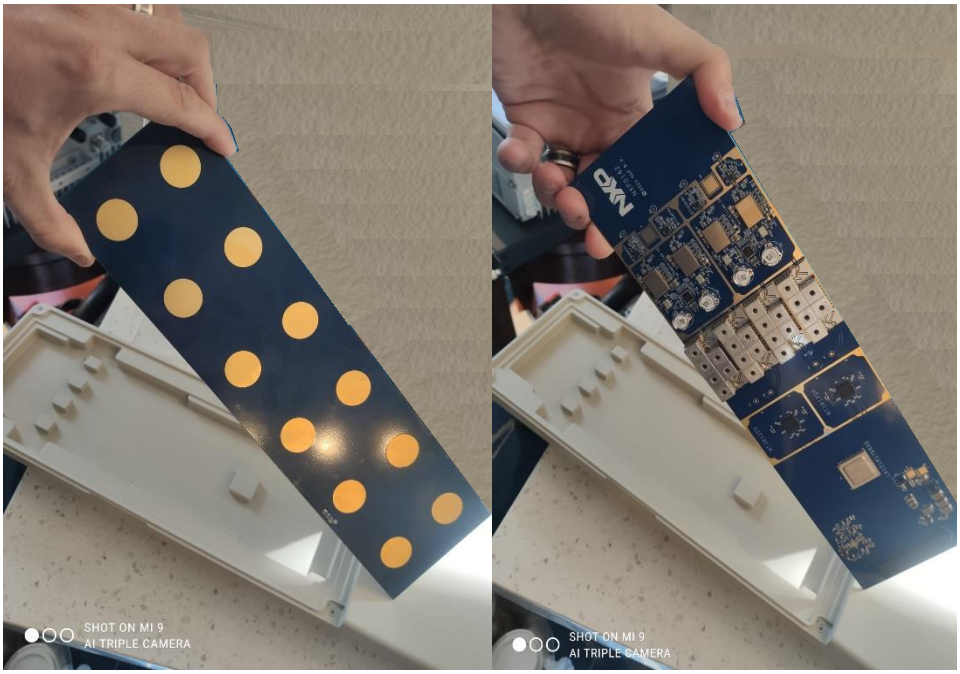
ARGO SEMI METANOIA

SINGLE BOARD SMALL CELL / RADIO UNIT



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