

swiss scientific initiative in health / security / environment systems



Miniaturized Antenna Design with Genetic Algorithm Optimization for Implantable Systems

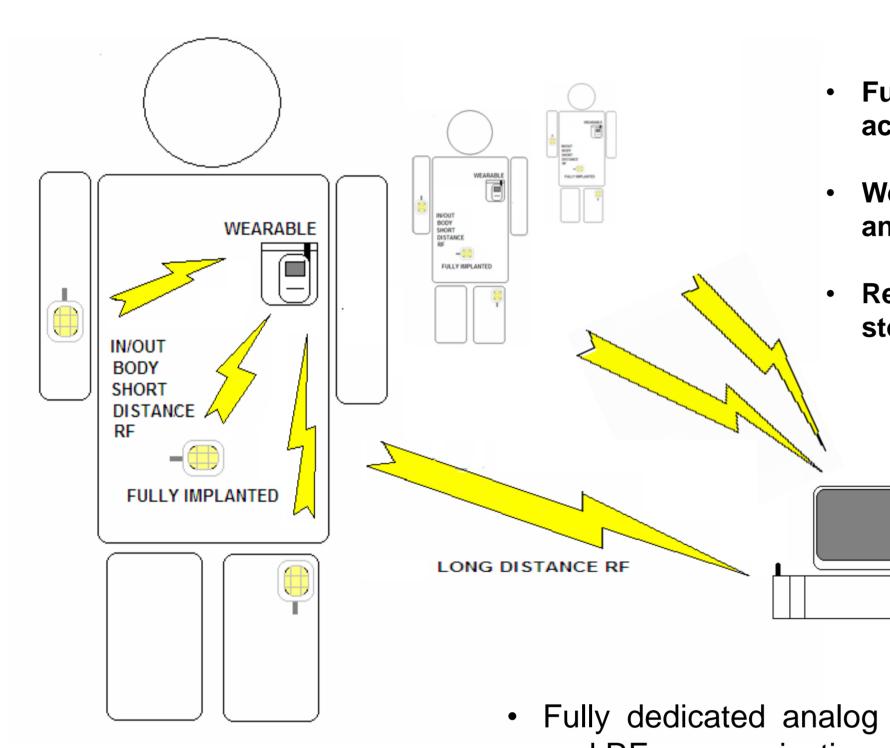


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Main Features of the Implantable Sensor System

- Fully implanted multi-sensor system
 RF short distance communication
- Communication on mobile phones platform
- Body Area Sensor Network

Conceptual Application and Features of the Project



3-KEY DEVICES

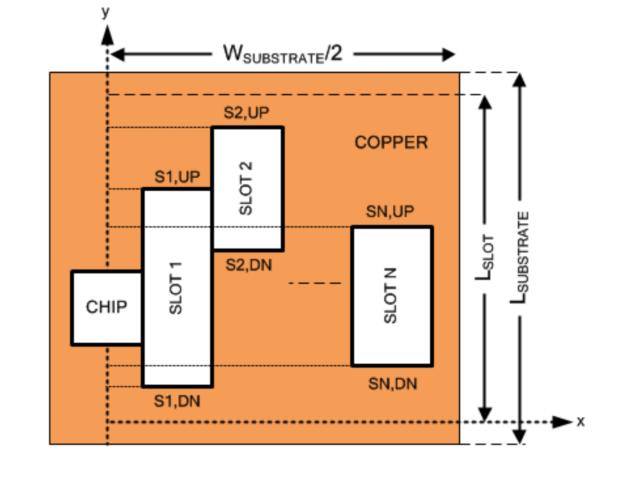
- Fully implantable sensors array for data acquisition
- Wearable station for remote powering and signal processing
- Remote station for data collection and storage

FEATURES

- High-frequency far-field
 remote powering
- Ultra-low power operation
- Fully dedicated analog and digital CMOS for detection and RF communication

Impedance Matched Tag Antenna Design with Genetic Algorithm Optimization

Non-resonant inductive impedance of meandered-slot antenna is used to match the capacitive rectifier impedance for remote powering. This technique eliminates additional matching network components therefore ensuring compact and minimum-size sensor-tag design



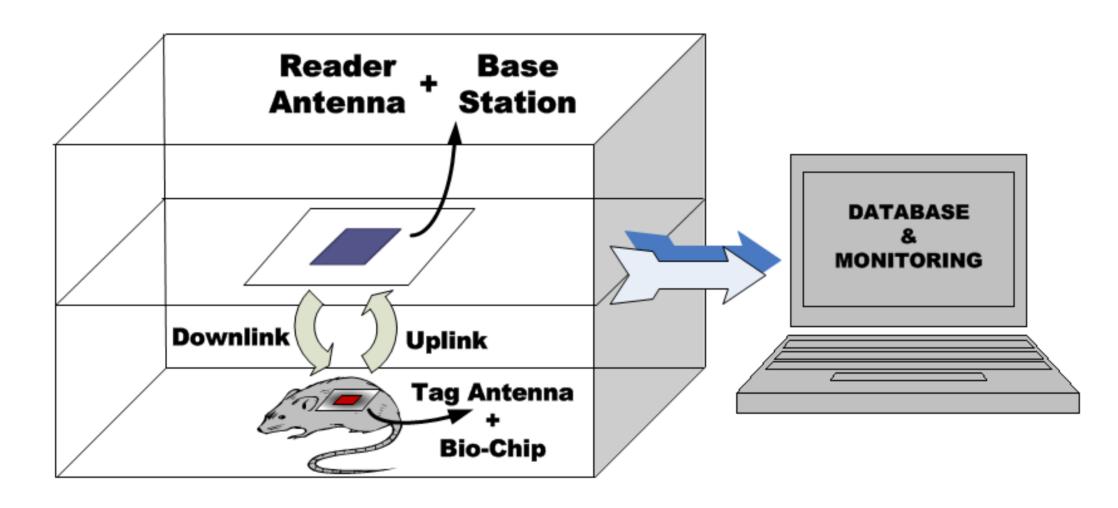
Parameterized Meandered-Slot Antenna Layout



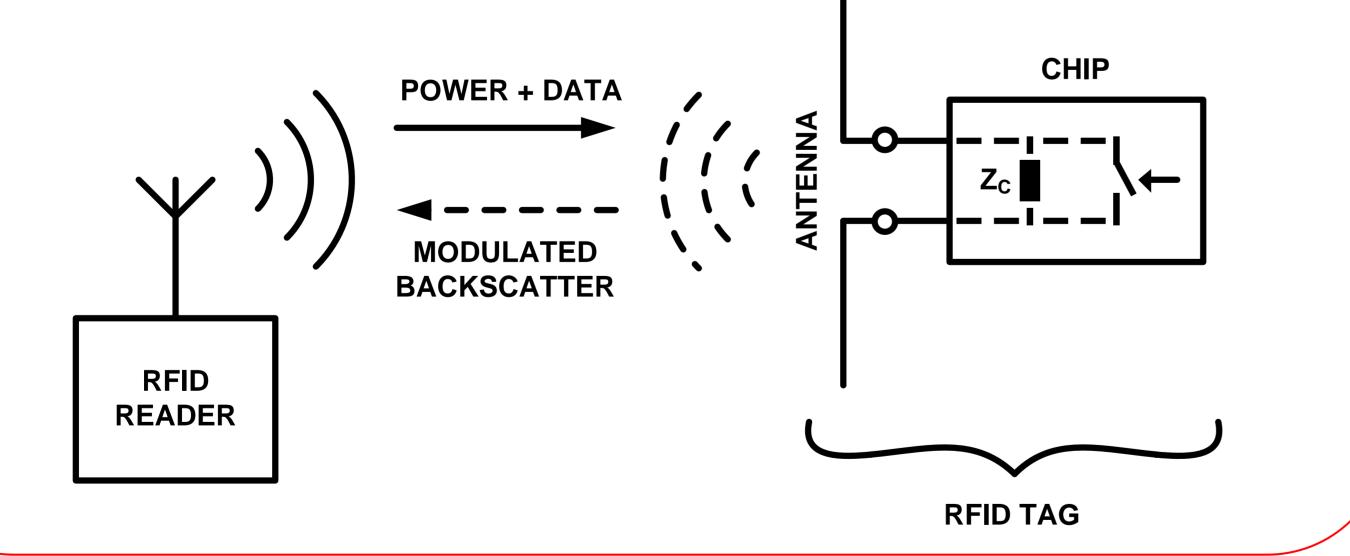
Meandered slot antenna optimized for $Z_{CHIP} = 15 - j250 \Omega$ at 2.45 GHz (20 mm x 20 mm)

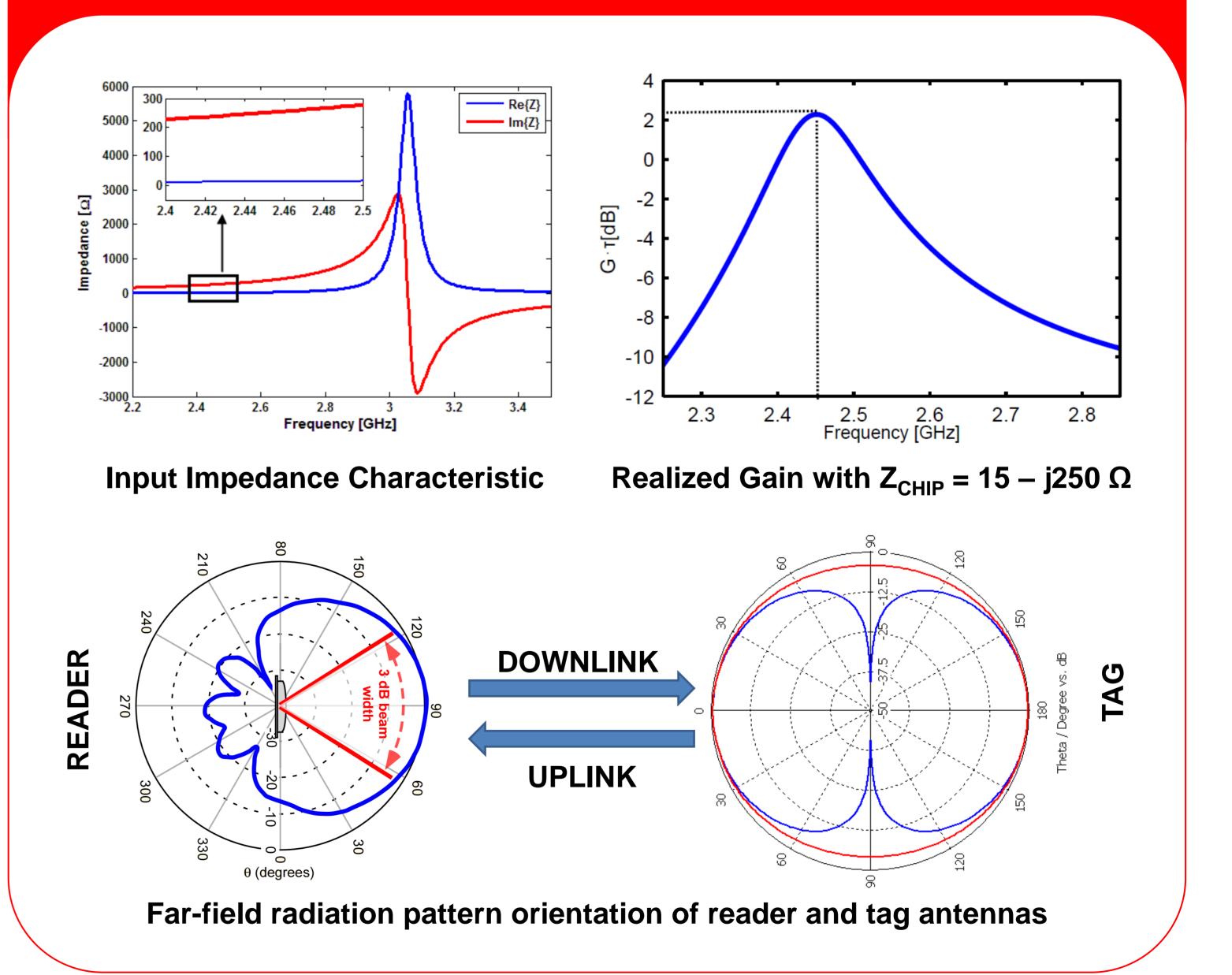
Application Platform with Mouse

Characteristics of the Antenna



Remote powering and wireless data communication is established with RFID Backscattering technique at 2.45 GHz





Academic Partners





Institute for Research in Biomedicine Istituto di Ricerca in Biomedicina





Publications

O. Kazanc, C. Dehollain, F. Maloberti, "Impedance-Matched Sensor-Tag Antenna Design Using Genetic Algorithm Optimization", ISMICT, pp.61-64, 2011





— ACP AG Advanced Circuit Pursuit