

# Radio Frequency Identification (RFID) System Overview

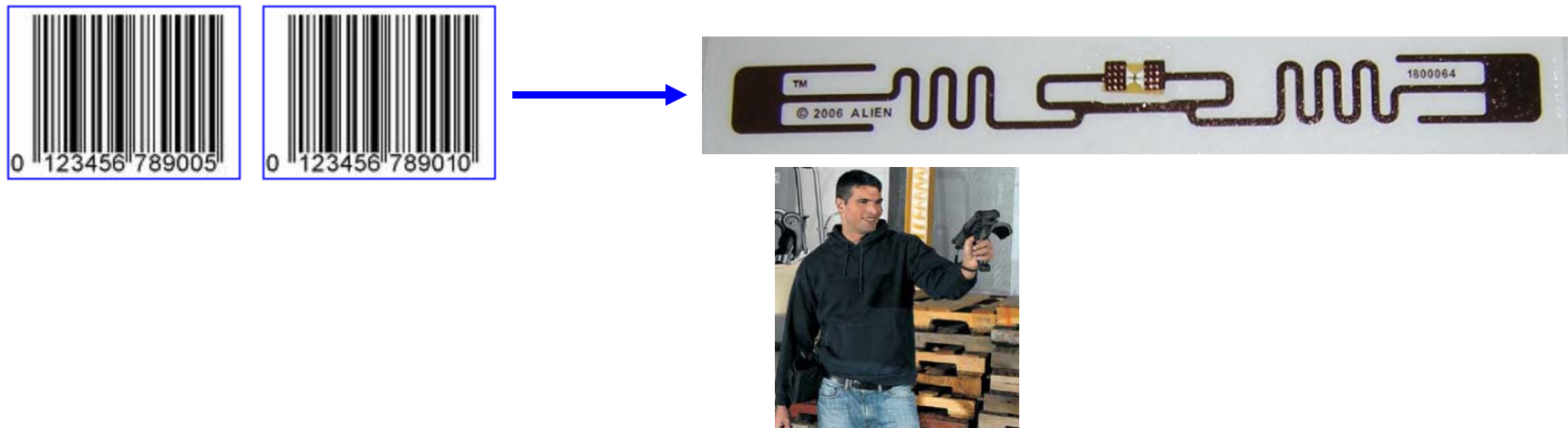
# RFID

- Overview
- Applications
- System Level Perspective
- Conclusions

\*\* Selected content provided by D. Thompson, University of Arkansas

# Overview

- Evolution of the bar code



- Features: Range, Sensing, Security, Implantable
- System: Asset + Tag + Reader + Infrastructure
- Complexities are application-specific

# Applications

- Asset Tracking



- Inventory



- Access / Toll Roads



- Medical Implants



# Implementation Issues

- Read speed



- Competing Reads



- Multipath

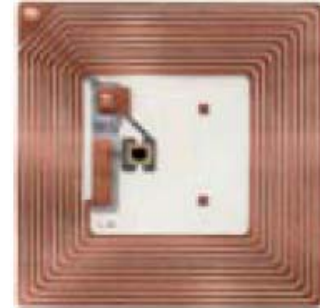


- Propagation



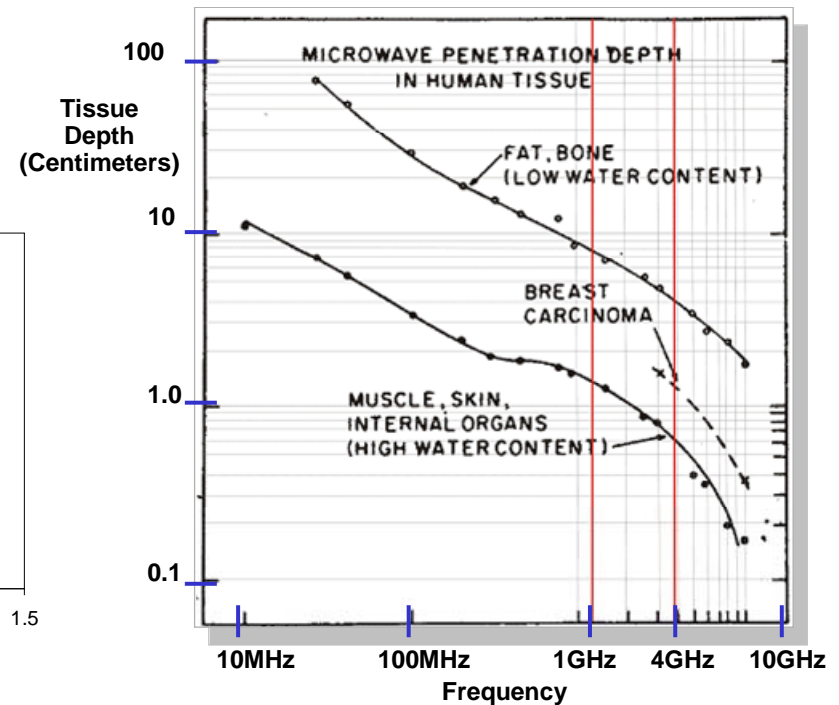
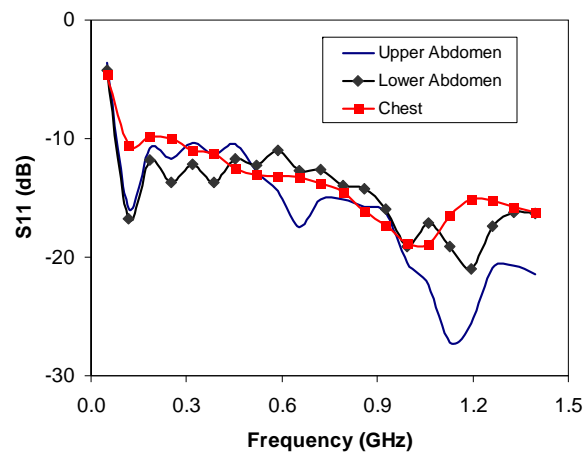
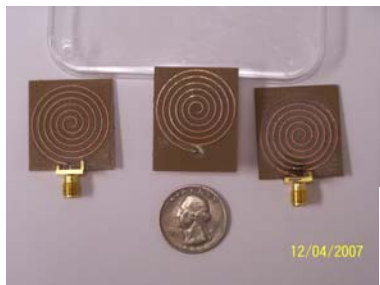
# System Level Perspectives

- Passive tags are powered by the reader and have limited range: affected by antenna design, tag size, frequency
- Antenna polarization: linear versus circular depends on orientation control; polarization loss issues
- Antennas can be de-tuned by the material of the asset
- Read speed affected by choice of modulation
- Security requires more data transfer, processing, **cost**



# System Level Perspectives

- Many issues associated with implanted tags and those mounted on bio/organic objects



# RFID – Conclusions

- Example of how wireless has transformed a simple idea (barcode) into an application with widespread commercial impact
- Many application-driven requirements that influence tag, reader and overall system design
- Antenna design is an important aspect

