Antenna-Less RFID Tag

An antenna-less RFID tag able to operate at any frequency with the flexibility to be reprogrammed to work in static or dynamic mode

Georgia Tech inventors have developed an antenna-less RFID tag which requires neither a tag antenna nor RF front-end circuits, thus leading to a system that does not have limitations on frequency at which tag can operate, can be reprogrammed to perform different functions such as emitting static bits or having dynamic communication, and overall leads to much simpler, smaller, and more reliable system. This technology is based on toggling electronic inverters that switch between two impedance states that can be read using any RF interrogator and a backscatter channel, which allows the information obtained by the RFID tag to be collected without the use of an antenna. This tag has the capability to operate at any frequency and can store a large number of static bits needed for asset identification and tracking or can be used for high data rate communication. Additionally, the technology enables easy programming of the tag such that existing hardware such as FPGAs can be programmed to behave as RFID tags.

Summary Bullets

- **Cheaper** – minimized transmission components significantly reduces manufacturing costs
- **Flexible** – tags can be reprogrammed to perform different functions
- **Smaller** - reduced number of components allows for smaller chips

Solution Advantages

- **Cheaper** – minimized transmission components significantly reduces manufacturing costs
- **Flexible** – tags can be reprogrammed to perform different functions
- **Smaller** - reduced number of components allows for smaller chips
- **Reliable** – transmission error rate of the one-millionth order
- **Functional** – maximum data transmission rate comparable to current RFID tags

Potential Commercial Applications

- RFID communications (multi-bit communications, high data-rate communications)
- Supply chain management, asset tracking, passport identification (36 bits static ID)
- Data exchange

Background and More Information

Radio-frequency identification systems (RFIDs) are highly sought after for many data collection applications, such as tracking devices, identification cards, and contact-less payment. A system of tag antennas and radio-frequency (RF) circuits are required for RFID tags to operate. This multi-component system approach limits at which frequency the tag has to operate, increases the size of the tag, increases manufacturing costs and reliability is dependent on all of the components functioning properly.

Inventors

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IP Status

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Publications

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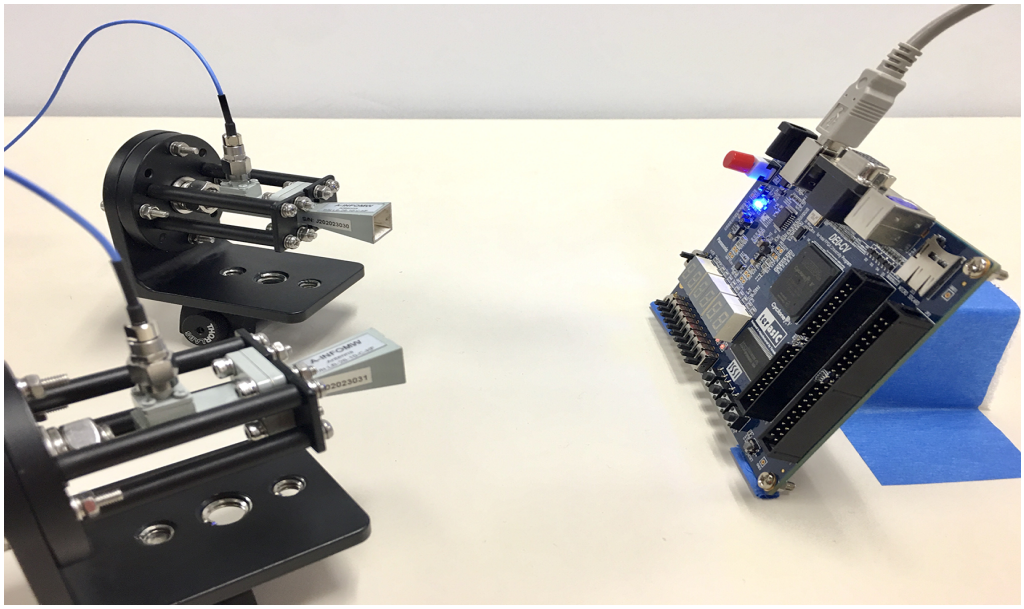
Images



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