Press Release ***For Immediate Release***

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Vubiq Networks Successfully Models Technology Claims of its Breakthrough RFID Hyperimaging Patents

Ansys and MATLAB simulation validates the first and only millimeter wave RFID technology to utilize FMCW radar with polarization and phase detection for low-cost, chipless RFID data tags

IRVINE, CA, May 26, 2021 – Vubiq Networks, Inc., the innovation leader in millimeter wave wireless broadband technology and solutions, today announced that it has successfully modeled its patented millimeter wave radio frequency identification (RFID) technology incorporating polarization and phase detection. Utilizing industry-standard 3D radar computer simulation and MATLAB algorithm implementation supplied by Ansys and MathWorks, the company has been able to validate the technology claims of its extensive RFID synthetic aperture radar (SAR) hyperimaging patent portfolio.

The breakthrough represents the first and only patented millimeter wave RFID hyperimaging technology to utilize polarimetric frequency modulated continuous wave (FMCW) radar. The company's innovative data encoding technology exploits the natural physics of antennas at a tremendously small scale. The result is a chipless RFID data tag that approaches the cost of printing a bar code, but with the ability to contain hundreds of data bits in the size of a postage stamp.

"We have successfully completed start-to-finish system-level simulation/post processing that clearly shows how our patented technique of encoding data into tiny millimeter wave antenna tag elements leverages the natural polarization and phase properties of those elements," said Mike Pettus, founder and CTO of Vubiq Networks. "We can now model the full RFID reader technology as a polarimetric FMCW radar using the latest 3D electromagnetic CAD tools from Ansys, combined with solving image formation and polarization/phase detection with our algorithms implemented in MATLAB."

With the completion of modeling and simulation, Vubiq now has the blueprint for creating unique tag elements that support low-cost, high-bit density tags for many of today's RFID applications.

Justin Patton, Director of the Auburn University RFID Lab, stated, "I'm very excited for the possibilities of millimeter wave for identification systems. With the current boom in demand for automated supply chain, sensor fusion of serialized identification is the focus of the future, and new tech like Vubiq may add some much-needed depth to the bench of options for item tracking."

The Auburn University RFID Lab is a research institute focusing on the business case and technical implementation of RFID and other emerging technologies in retail, aviation, supply chain and manufacturing.

An animated video demonstrating Vubiq Networks' RFID hyperimaging technology can be viewed at www.vubiqnetworks.com/chipless-rfid-tag-hyperimaging.

Advantage of polarization and phase detection

Utilizing the company's innovative polarimetric synthetic aperture radar (POLSAR) hyperimaging techniques incorporating polarization and phase detection, not only can the data be retrieved from the tag, but also physically located. This breakthrough approach significantly reduces cost, while providing performance advantages and features not available with existing RFID solutions.

The new technology addresses the downfalls of traditional RFID approaches. The chipless technology solves today's biggest barrier: the cost of the RFID tag. Vubiq Networks' approach reduces tag costs to less than a penny per tag. With POLSAR, multiple tag collisions are no longer an issue, and the use of millimeter wave as the frequency spectrum greatly increases reader performance. Utilizing POLSAR hyperimaging greatly expands the use cases by providing the ability to read multiple tags simultaneously, as well as determining their three-dimensional location.

"Our unique technology can simultaneous locate and identify thousands of RFID tags," said Vubiq CEO John Dilworth. "Our hyperimaging approach can penetrate materials like pill bottles, envelopes, and cardboard boxes, eliminating the need to unpackage and scan each individual tagged package or product."

Radar comes to the smartphone

Vubiq Networks predicts that smartphones may soon become default readers for the company's RFID technology. "Google's Pixel 4 phone and Apple's new iPhone both contain radar-like features," said Mr. Dilworth. "Google's hand gesturing application employs a fully function radar chip called Soli. And Apple's new Lidar feature further shows promise of fully functional radar included in every smartphone. These innovations in smartphone technology increase the value of our novel invention."

Patent portfolio

Vubiq Networks has a long history of innovation in millimeter wave RFID hyperimaging technology. Today's simulation and modeling announcement validates the claims contained in the company's RFID patent portfolio:

- US Patent 7460014 issued 12-2-08 – RFID System Utilizing Parametric Reflective Technology
- US Patent 7498940 issued 3-3-09 – RFID System Utilizing Parametric Reradiated Technology
- US Patent 10839179 issued 11-17-20 – Multimode Millimeter Wave RFID Systems and Methods of Use Thereof
- US Patent Application 2020/0184161 published 6-11-20 – High Bit Density Millimeter Wave RFID Systems, Devices, and Methods Thereof

About Vubiq Networks

Vubiq Networks, Inc. is a privately held millimeter wave innovation company headquartered in Irvine, California. With over 15 years of experience in telecommunications and extremely high frequency (EHF) applications, the company continues to expand its global reach into cutting-edge markets such as 5G connectivity, wireless fabric architecture, chipless RFID data tag hyperimaging, IoT smart sensors, EHF medical applications, and more. The company currently offers the HaulPass V10g millimeter wave radio, the first and only 10Gbps V-Band wireless link in the industry, as well as the HaulPass E10g 10Gbps E-Band radio. For further information, visit www.vubiqnetworks.com. To view a video demonstrating the company's RFID technology, visit www.vubiqnetworks.com/chipless-rfid-tag-hyperimaging.

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