

An Adaptive Beam-Steering I/Q Receiver Array

Tech ID: 23398 / UC Case 2013-180-0

BACKGROUND

To achieve maximum SNR and minimum interference, phased array antennas have gained popularity in high-capacity communication networks as an electronically steerable alternative to fixed-direction antenna. Fixed direction antennas have a high installation cost though as beam alignment must be very precise to maintain high SNR. Coupled with this high installation cost is the unavoidable alignment issues that arise with building sway under wind loading conditions. What is needed is an adaptive technique based on phased array antenna which will accommodate off angle RF signals at the receive side of the communications link.

TECHNOLOGY DESCRIPTION

Researchers at UC San Diego’s Jacobs School of Engineering have developed a novel RF receiver array that implements a direction-finding operation to optimally and in real-time align the “best” receiver beam with the incoming RF signal path. The novel circuit is fully prototyped and tested and may be evaluated for licensing interest. The measured array operates at 8.1 GHz and covers steering angles of +/- 35 degrees for a four element array. Additionally the receiver incorporates a down converter and demodulates 64-QAM with EVM of less than 4%. The chip is fabricated in a 45 nm CMOS SOI process with an area of 3.45 mm2 and consuming 143 mW dc.

Available materials for evaluation include:

1. Cadence design library containing schematics of the entire receiver array circuitry
2. Cadence design library containing schematic test benches with ADE states
3. Sonnet project files for the inductors used in the design

APPLICATIONS

- Point-to-point communication links
- Satellite systems
- Sensor systems
- Radar
- RFID

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	9,929,466	03/27/2018	2013-180

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OTHER INFORMATION

CATEGORIZED AS

- **Communications**
- Other
- **Computer**
- Hardware

RELATED CASES

2013-180-0

