Passive Coupling Balance Scheme for Long Traveling Complex Differential Signals

Tech ID: 29224 / UC Case 2016-979-0

ABSTRACT

Researchers at the University of California, Davis have developed a passive coupling balance technique to suppress signal mismatches for long traveling N-pair complex differential signals.

FULL DESCRIPTION

As signal frequencies increase, mutual coupling between signals gives rise to a variety of problems including: increased signal crosstalk, increased in-phase and quadrature (IQ) imbalances of complex signals and co-channel interference. There are several ways to suppress the signal mismatches but these methods not only require specific circuit designs and complex algorithms to accommodate the unexpected mismatches, they also slow down the processing of the entire signal.

Researchers at the University of California, Davis have developed a passive coupling balance scheme for differential signals by using twisting schemes. The technique passively suppresses mismatches, requiring no additional circuitry. It exhibits sufficient suppression even at higher frequencies without requiring additional power by scaling the structure. With a simple fabrication process, this technique works well for multi-phase signaling applications.

APPLICATIONS

- Digital communications systems
- Radar systems
- Improved 4G antennas
- Multiphase Voltage-controlled Oscillators (VCOs)
- Quadrature processing

FEATURES/BENEFITS

- Utilizes a passive method to decrease quadrature signal mismatches
- Allows for the pairs to be pulled away at distances that still retain robustness
- Does not require additional circuitry

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,426,023	09/24/2019	2016-979

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Passive Wideband Interferometer Enabled Error Feedback Transmitter
- High-Efficiency Broadband Doubler
- Hybrid SPST Switch Delivers High Isolation Over an Ultra-wide Bandwidth
- Nonlinearity Factorization for Up-Conversion Mixer Linearity Analysis
- Frequency Discriminator-based Phase Noise Filter (PNF) for Ultra-Clean LO/Clock

CONTACT

Michael M. Mueller
mmmueller@ucdavis.edu
tel: .

INVENTORS

- Gu, Qun
- Li, Jinbo

OTHER INFORMATION

KEYWORDS

image rejection ratio, IMRR, IMR, quadrature signal accuracy, transmitter, multi-phase signal processing, IQ, I/Q, n-pair, complex signals, long travel, digital circuits, high frequency signals, twisting scheme, passive coupling

CATEGORIZED AS

- **Communications**
  - Other

RELATED CASES

2016-979-0

University of California, Davis
InnovationAccess
1850 Research Park Drive, Suite 100, ,
Davis,CA 95618

Tel: 530.754.8649
innovationAccess@ucdavis.edu
research.ucdavis.edu/u/s/ia
Fax: 530.754.7620