



A DISTRIBUTED CIRCUIT FOR CANCELLING SELF-INTERFERENCE IN A FULL DUPLEX COMMUNICATION SYSTEM USING ELECTRICAL BALANCE

IITM Technology Available for Licensing

Problem Statement

- Full-duplex communication systems face self-interference issues due to simultaneous transmission and reception on the same frequency.
- Current methods for canceling self-interference involve subtracting the transmitted signal from the received signal, but practical imperfections hinder exact subtraction.
- The use of hybrid-transformers to provide isolation between transmitter and receiver introduces limitations on system frequency due to parasitic capacitance and capacitive coupling.

Intellectual Property

- IITM IDF Ref. 1065
- IN 356249 - Patent Granted

Technology Category/ Market

Category - Signal Processing

Applications-Telecommunications Infrastructure Optimization

Industry- Telecommunications and Networking

Market- Global RF components market size is expected to reach \$67 Bn by 2028 at a rate of 17.%.

Key Features / Value Proposition

1. Electrical Balance:

- Leveraging innovative electrical balance mechanisms, the circuit minimizes self-interference, enabling reliable communication even in challenging RF environments

2. Quarter Wave Transformers (QWTs):

- Key technical components, QWTs facilitate efficient signal splitting and isolation, contributing to enhanced signal integrity and reduced transmission errors.

3. Impedance Matching:

- Incorporating impedance matching transformers, the circuit ensures optimal signal transfer between transmitters and receivers.

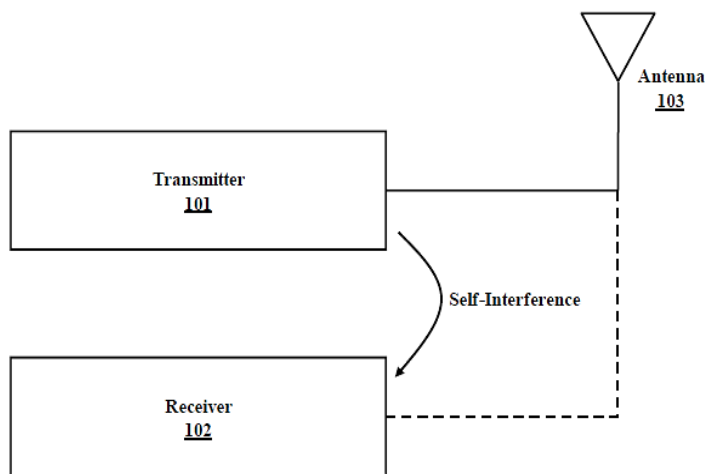


FIG. 1. illustrates a symmetrical circuit for cancelling self-interference in a full-duplex communication system.

Technology

- The described circuit and method aim to cancel self-interference in full-duplex communication systems by employing electrical balance through Quarter Wave Transformers (QWTs).
- This involves splitting the received signal into two components, forwarding them through separate QWTs to isolate the transmitter and receiver, and subtracting the transmitted signal from the received signal to create a resultant signal.
- By utilizing this technique, the circuit ensures effective cancellation of self-interference, facilitating smoother communication between transmitters and receivers in full-duplex systems.

TRL (Technology Readiness Level)

TRL- 4: Technology validated in lab scale.

Research Lab

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