Columbia Technology Ventures

Circuits for reducing transmitter self-interference in cellular and wireless devices

Technology #cu14230

Although integration of radio devices for cellular and wireless communication improves products by reducing cost and size while increasing speed, increasing the number of devices in a system-on-chip (SoC) also increases signal interference. Current techniques to isolate devices either require bulky components or are ineffective. This technology introduces a compact, active noise cancellation technique that achieves high distortion cancellation and signal isolation. This noise cancellation decreases transmitter leakage in the receiver band, enabling the design of SoCs with higher level integration.

A common-gate common source noise cancelling amplifier enables the production of highly integrated wireless communication devices

This technology achieves the difficult task of reducing transmitter leakage and noise in the receiver band of integrated circuits using a common-gate common source noise cancelling amplifier. Traditionally, active cancellation introduces noise from the cancellation circuitry, but this design also removes that noise. The result is a system that can handle more powerful leakage levels. The ability to decrease the leakage and increase the integration level has the potential to significantly reduce both the size and cost of commercial wireless systems. The small size of the additional active cancellation hardware helps make this possible.

A prototype receiver has been assembled and tested, displaying noise cancellation of a 2 dB transmitter signal with 25 dB isolation of the transmitter and receiver.

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Applications:

- Integrated system-on-chip (SoC) circuits with less transmitter leakage and noise
- Improved cellular (CDMA, LTE, GSM) and connectivity (WiFi, Bluetooth) wireless systems
Advantages:

• Greatly improved noise cancellation allowing for increased integration
• Compact system-on-chip (SoC) device
• Lower cost wireless device

Patent Information:

Patent Pending (US 20160359521)

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Related Publications:


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