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Singhal et al.

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(54) **GAIN REDUCTION TECHNIQUES FOR
RADIO-FREQUENCY AMPLIFIERS**

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(71) Applicant: **Apple Inc.**, Cupertino, CA (US)

(72) Inventors: **Nitesh Singhal**, Santa Clara, CA (US);
Mark G. Forbes, San Carlos, CA (US)

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(57) **ABSTRACT**

An electronic device may include wireless circuitry with a processor, a transceiver, an antenna, and a front-end module coupled between the transceiver and the antenna. The front-end module may include one or more radio-frequency amplifiers for amplifying a radio-frequency signal. The radio-frequency amplifier may include input transistors cross-coupled with capacitance neutralization transistors and/or coupled to cascode transistors. One or more n-type gain adjustment transistors may be coupled to source terminals of the capacitance neutralization transistors. One or more p-type gain adjustment transistors may be coupled to source terminals of the cascode transistors. One or more processors in the electronic device can selectively activate one or more of the gain adjustment transistors to reduce the gain of the radio-frequency amplifier without degrading noise performance and without altering the in-band frequency response of the radio-frequency amplifier.

