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**CHANG et al.**(10) **Pub. No.: US 2023/0231525 A1**(43) **Pub. Date: Jul. 20, 2023**(54) **VARIABLE GAIN AMPLIFIER CIRCUIT AND METHOD HAVING LINEARITY COMPENSATION MECHANISM**(71) Applicant: **REALTEK SEMICONDUCTOR CORPORATION, HSINCHU (TW)**(72) Inventors: **YANG CHANG, HSINCHU (TW); CHIA-JUN CHANG, HSINCHU (TW)**(21) Appl. No.: **18/087,261**(22) Filed: **Dec. 22, 2022**(30) **Foreign Application Priority Data**

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**ABSTRACT**

The present invention discloses a variable gain amplifier circuit having linearity compensation mechanism is provided. A lower amplification transistor of a lower branch of an amplification circuit is controlled by an AC input signal. Upper amplification transistors of an upper branch generate an AC output signal at an amplification output terminal. An amplification control circuit controls the turn-on and turn-off of the upper amplification transistor according to an amplification control voltage. An inductor is electrically coupled between a power supply terminal and the amplification output terminal. In a gain adjustment circuit, each of adjustment control circuits controls the turn-on and turn-off of each of adjustment transistors according to a adjustment control voltage. A first voltage adjustment circuit adjusts an impedance of each of the adjustment transistors to further adjust an AC cross voltage relation between the lower amplification transistor and the upper amplification transistors.

