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VARIABLE GAIN AMPLIFIER**(52) **U.S. Cl.**CPC ..... *H03G 3/3036* (2013.01); *H03G 1/0088*  
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3/45183 (2013.01)(71) Applicant: **Marvell Asia Pte Ltd.**, Singapore (SG)(72) Inventors: **Praveen PRABHA**, Lake Forest, CA  
(US); **Karthik Raviprakash**, San Jose,  
CA (US); **Luke Wang**, San Jose, CA  
(US); **Stephane Dallaire**, Gatineau, CA  
(US)

(57)

**ABSTRACT**

A variable gain amplifier includes input terminals configured to receive a differential input of the variable gain amplifier, output terminals configured to generate a differential output of the variable gain amplifier, the differential output having a gain applied by the variable gain amplifier to the differential input, and an impedance ladder circuit coupled to the input terminals, the impedance ladder circuit comprising a plurality of semiconductor switches configured to receive respective control signals based on a control voltage. The plurality of semiconductor switches are responsive to the respective control signals to adjust the gain of the variable gain amplifier and configured with a predetermined exponential scale such that the impedance ladder circuit causes a slope of the gain of the variable gain amplifier relative to the control voltage to be generally linear.

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