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# United States Patent [19] Rincon-Mora

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## [54] OPTIMIZED FREQUENCY SHAPING CIRCUIT TOPOLOGIES FOR LDOs

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### Related U.S. Application Data

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323/280

[58] Field of Search ..... 323/273, 280;  
327/540, 541, 543, 538, 552; 330/107,  
109

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### [57] ABSTRACT

A low drop-out regulator **16** includes an error amplifier **18** having a first input for receiving a reference voltage  $V_{ref}$ , a second input, and an output, a pass element **22** having a control terminal coupled to the output of the error amplifier and a current path coupled between an input voltage  $V_{in}$  and an output terminal  $V_{out}$ , and a pair of resistors **24**, **26** coupled in series between the output terminal  $V_{out}$  and ground. The second input of the error amplifier **18** coupled to a node B between the pair of resistors. The error amplifier provides an added pole/zero pair in the frequency response of the regulator.

**4 Claims, 4 Drawing Sheets**



















